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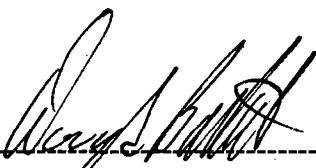
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**FIVE-YEAR REVIEW REPORT FOR
NL INDUSTRIES/TARACORP LEAD SMELTER SUPERFUND SITE
Granite City, IL**



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Date

3/28/2014

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LIST OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
AMP	Appropriate Management Practices
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DD/ESD	Decision Document/Explanation of Significant Differences
EC	Environmental Covenant
FYR	Five-Year Review
ICs	Institutional Controls
IEPA	Illinois Environmental Protection Agency
LTS	Long-Term Stewardship
MCCDA	Madison County Community Development Agency
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PPM	parts per million
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
RPM	Remedial Project Manager
SEP	Supplemental Environmental Project
UAO	Unilateral Administrative Order
U.S. EPA	United States Environmental Protection Agency
UECA	Uniform Environmental Covenants Act
UU/UE	Unlimited Use or Unrestricted Exposure

EXECUTIVE SUMMARY

This is the fourth Five-Year Review (FYR) for the NL/Taracorp Secondary Lead Smelter Superfund (Site) located in Granite City¹, IL. The FYR is being conducted by the United States Environmental Protection Agency (U.S. EPA). The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory FYR was the signing of the previous FYR on 3/30/2009.

The NL Industries/Taracorp Lead Smelter property was a lead-acid battery reclamation facility and secondary lead smelter that operated from the turn of the twentieth century until 1983. Smelting activities resulted in lead air emissions that exceeded the National Ambient Air Quality standards (NAAQS) for lead during the operation of the smelter. The main industrial portion of the former smelter facility is currently describes as approximately 16 acres, but the contamination was spread via stack emissions and fill activities throughout a three-city area (Granite City, Madison, and Venice, Illinois) and isolated areas in neighboring communities (the Site). After the smelter was shut down, residual contamination of metals, primarily lead, was found to exist in various locations. Residual contamination was found in soils on residential and commercial/industrial properties within an approximately two-mile radius of the smelter (deposited by smelter stack emissions) and on residential yards, commercial properties, alleys, and parking lots where crushed, hard rubber battery casing material was used as fill in dozens of locations within a 15-mile radius of the smelter property. Additionally, residual metals contamination was found on the main industrial property 1) near the former operations in the parking lot and road due to residual contamination from the process; and 2) in a 3.5 acre waste pile consisting of slag, battery cases, and other debris on the main industrial property (referred to as the Taracorp pile). Finally, residual groundwater contamination was found in the immediate vicinity of the former battery breaker adjacent to the Taracorp pile. The primary risks posed by the metals contamination were from direct contact and ingestion of contaminated soils and waste materials.

In 1985, the U.S. EPA and NL Industries entered into an agreement for NL Industries to carry out a Remedial Investigation and Feasibility Study (RI/FS). NL Industries completed the RI/FS in August 1989. EPA wrote an addendum to the FS Report, and a Record of Decision (ROD) was signed on March 30, 1990. After reviewing the remedy at the request of the court, U.S. EPA issued a Decision Document/Explanation of Significant Differences (DD/ESD) on September 29, 1995. The DD/ESD added to the ROD several provisions, including confirmation of the residential cleanup standard of 500 ppm of lead in soil and a provision to address groundwater contamination, among others.

The remedy for the Site was implemented from early 1993 through May 2000. The remedial action commenced with U.S. EPA as the lead agency and was converted to PRP-lead in 1998 through a legal agreement (Consent Decree). In 1993, the cleanup began on approximately 1,600 residential properties contaminated with lead from smelter stack emissions. Approximately 70 alleys, parking lots, and driveways where the crushed battery casing material was used as fill were also addressed under the remedial action. In 1998, capping of the Taracorp pile began. The majority of the work was completed by spring of 2000, and the Preliminary Close-Out Report was completed on September 26, 2000, by the U.S. EPA. The groundwater was not

¹ The cleanup area involved the following: Granite City, Madison and Venice (including Eagle Park Acres), Illinois

remediated because the metals were not migrating more than approximately 200 feet from the Taracorp pile. All cleanup activities, with the exception of the residential properties where access was refused, were completed in 2000. Groundwater monitoring occurs every five years and cap inspections of the Taracorp pile continue to the present at least twice per year.

Since the last FYR, the PRP Group, under direction of U.S. EPA and Illinois Environmental Protection Agency (IEPA), has periodically checked in with the residential property owners who initially refused access for sampling or remediation about access. To date, 76 of 94 (approximately 81 %) of the previously denied access properties have now agreed to allow access. This work is ongoing. Additional work is ongoing which relates to ensuring that effective Institutional Controls (ICs) are implemented, monitored, maintained, and enforced. The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because the final remedy for the most part has been fully implemented.

The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current unacceptable exposures; and the groundwater contamination is confined to the former lead smelter property. Further, the Remedial Action Consent Decree (RA CD) provides an additional measure of protection by requiring the implementation of a Supplemental Environmental Project (SEP) to address lead based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site.

However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness. Effective ICs need to be implemented. Compliance with ICs needs to be ensured by adopting long-term stewardship procedures that maintain, monitor, and enforce effective ICs as well as maintaining the Site remedy components. Groundwater monitoring needs to be performed. Repairs to the security fence and placement of warning signs are needed. Lastly, U.S. EPA will continue to require periodic monitoring of residential yards that are adjacent to yards where the residents who refused access for the cleanup or that are near the Site, so if recontamination occurs, it can be addressed before it becomes a potential health issue.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: NL/Taracorp Secondary Lead Smelter Site		
EPA ID: ILD096731468		
Region: 5	State: IL	City/County: Granite City/Madison County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: U.S. EPA		
Author name (Federal or State Project Manager): Sheri L. Bianchin		
Author affiliation: U.S. EPA		
Review period: November 2012 – March 2014		
Date of site inspection: 11/7/2013		
Type of review: Statutory		
Review number: 4		
Triggering action date: 3/30/2009		
Due date (five years after triggering action date): 3/30/2014		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Institutional Controls			
	Issue: Effective ICs are not yet in-place.			
	Recommendation #1 : Effective ICs must be implemented along with long term stewardship procedures (LTS) to ensure the ICs are maintained, monitored, and enforced.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRPs/ U.S. EPA	U.S. EPA/State	3/31/2016

OU(s): 1	Issue Category: Monitoring			
	Issue: Groundwater Monitoring was delayed due to extreme weather conditions and needs to be conducted to ensure that groundwater has not migrated.			
	Recommendation#2: Perform groundwater monitoring according to the approved Work Plan and take any follow-up actions if needed.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRPs	U.S. EPA/State	6/30/2014

OU(s): 1	Issue Category: Site Access/Security			
	Issue: Fencing and signage need to be monitored and repaired.			
	Recommendation#3: Monitor fence around Taracorp pile to ensure it remains intact and complete repair of fencing, if needed, and installation of warning signage by Taracorp Pile.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRPs	U.S. EPA/State	6/30/2014

OU(s): 1	Issue Category: Changed Site Conditions			
	Issue: Review Remedy Decision Documents may not be clear relative to ICs.			
	Recommendation#4: Review Remedy Decision Documents to determine if clarification is required regarding additional ICs. If so, provide appropriate documentation such as an Explanation of Significant Differences (ESD).			
Affect Current Protectiveness)	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	U.S. EPA/State	U.S. EPA	12/30/2016

OU(s): 1	Issue Category: Monitoring			
	Issue: Recontamination issues of residential yards should be prevented.			
	Recommendation #5: U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup or near the Site so that recontamination, if it occurs, can be addressed before it becomes a potential health issue.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRPs	U.S. EPA/State	3/30/2019

Protectiveness Statement(s)

<i>Operable Unit:</i> 1	<i>Protectiveness Determination:</i> Short-term Protective
<p>Protectiveness Statement:</p> <p>The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current unacceptable exposures; and the groundwater contamination is confined to the former lead smelter property. Further, the RA CD provides an additional measure of protection by requiring the implementation of a supplemental environmental project (SEP) to address lead based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site.</p> <p>However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness. Effective ICs need to be implemented. Compliance with ICs needs to be ensured by implementing long term stewardship procedures that maintain, monitor, and enforce effective ICs as well as maintaining the site remedy components.</p>	

Groundwater monitoring needs to be implemented. Repairs to the security fence and placement of warning signs are needed. Last, U.S. EPA will continue to require periodic monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup and adjacent to the Site so that if recontamination occurs, it can be addressed before it becomes a potential health issue.

Sitewide Protectiveness Statement

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current unacceptable exposures; and the groundwater contamination is confined to the former lead smelter property. Further, the RA CD provides an additional measure of protection by requiring the implementation of a supplemental environmental project (SEP) to address lead based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site.

However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness. Effective ICs need to be implemented. Compliance with ICs needs to be ensured by adopting long-term stewardship procedures that maintain, monitor, and enforce effective ICs as well as maintaining the site remedy components. Groundwater monitoring needs to be performed. Repairs to the security fence and placement of warning signs are needed. Last, U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup or near the Site so that recontamination, if it occurs, can be addressed before it becomes a potential health issue.

I. INTRODUCTION

The purpose of Five-Year Reviews is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”

U.S. EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.”

U.S. EPA conducted a FYR of the remedy implemented at the NL/Taracorp Lead Smelter Superfund Site in Granite City, IL. U.S. EPA is the lead agency for developing and implementing the remedy for the Site. The IEPA, as the support agency representing the State of Illinois, has reviewed all supporting documentation and provided input to U.S. EPA during the FYR process.

This is the fourth FYR for the NL/Taracorp Lead Smelter Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR completed on March 30, 2009. The FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one Operable Unit (OU) which is addressed in this FYR.

II. PROGRESS SINCE THE LAST REVIEW

Table 1: Protectiveness Determinations/Statements from the 2009 FYR

OU #	Protectiveness Determination	Protectiveness Statement
OU1/Sitewide	Short-term Protective	<p>The remedy at the Site is protective of human health and the environment in the short term because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current exposure (even for the concern noted in the Slough Road area where the battery chips have been disbursed beyond the capped area); and the groundwater contamination is contained under the former lead smelter property. Further, the CD provides an extra measure of protection by requiring the implementation of a SEP to address lead-based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site. U.S. EPA will need to continue to monitor the progress of the lead-based paint SEP, which is required by the CD but is not part of the selected remedy. However, required ICs are not yet in place. Long-term protectiveness of the remedy requires implementation of effective ICs and monitoring, maintenance and compliance with effective ICs along with remedy components. Compliance with ICs will be ensured through long term stewardship by implementing, maintaining, monitoring and enforcing effective ICs as well as maintaining the site remedy components. Last, U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue. U.S. EPA will also periodically check the residences which refused access for sampling or remediation to see if the owners have reconsidered their access refusal or if new owners would like to have the properties cleaned up, and take action as appropriate.</p>

Table 2: Status of Recommendations from the 2009 FYR

O U #	Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
1	1. Institutional controls need to be implemented, monitored, and maintained.	To assure that the ICs will be implemented, monitored, maintained and enforced, U.S. EPA will continue to work with the PRP Group to approve the IC Work Plan and oversee implementation.	PRP	U.S. EPA/State	3/31/2011	Ongoing	NA
1	2. Minor ridges on cap are evident in one area.	Minor ridges on the cap shall be filled/reseeded during next routine O&M event.	PRP	U.S. EPA/State	6/30/2009	Completed	6/30/2009
1	3. Spread of battery chips is evident beyond paved area in Slough Road area.	Explore removal/capping and/or additional restrictions in the Slough Road area to assure no exposure is occurring.	PRP	U.S. EPA/State	6/30/2010	Ongoing	NA
1	4. 94 residential yards have not been sampled and/or remediated due to access refusal	U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue. U.S. EPA will also periodically* check the residences which refused access for sampling or remediation to see if the owners have reconsidered their access refusal or if new owners would like to have the properties	PRP	U.S. EPA/State	3/30/2014	Ongoing	NA

		cleaned up, and take action as appropriate.					
1	5. SEP implementation needs to continue.	SEP implementation needs to continue under U.S. EPA oversight.	Madison County Community Development Agency	U.S. EPA	3/31/2011	Ongoing	NA

* Such as at least every five years during the FYR process.

Further explanations of the information contained in the chart above are as follows:

Recommendation 1

A draft Institutional Controls Work Plan (ICWP) has been submitted by the PRP Group and approved by U.S. EPA. Monthly meetings have occurred to discuss the ICWP, the ICs required for this Site to address the areas which will not allow for UU/UE, and an ordinance for certain alleys and roadways in Venice, IL. In consultation with U.S. EPA and IEPA, the PRP Group has continued to develop a program for ICs at the Site, which includes:

- Mapping of the areas where ICs are required;
- Preparation of environmental covenants (ECs);
- Preparation of a one-call notification program, including an excavation advisory, to be implemented through JULIE, the Illinois one-call notification system;
- Preparation of an ordinance for the certain alleys and roadways in Venice;
- Issuance of biennial notification letters by U.S. EPA to certain landowners; and
- Preparation of a communication plan.

See also the IC section below and Appendix F which includes a summary of IC evaluation activities.

Recommendation 2

The Site PRP Group promptly completed repair of the cap in the spring of 2009.

Recommendations 3

The areas with battery chips areas are being dealt with in the ICWP discussed in Recommendation 1 above.

Recommendation 4

Under the direction of U.S. EPA and IEPA, the PRP Group has completed access efforts and soil sampling activities for 76 of 94 (81%) residential properties. The results are summarized in the Data Review section below. The PRP Group will continue to follow up with the remaining 18 residential properties to see if the owners have reconsidered their access refusal or if new owners would like to have their properties sampled and any cleanup actions taken as needed.

Recommendation 5

The last FYR noted that the SEP was underway and required U.S. EPA to continue to monitor the SEP. The SEP continues to be implemented by the PRP Group and Madison County Health Department. An extension for completing the work was granted by U.S. EPA, until March 2017. This is discussed further below.

Remedy Implementation Activities

The remedy implementation activities at the Site during this FYR period are described below.

Residential Yards

Approximately 1,600 residential yards were remediated during the remedial action phase of the Site conducted from 1993 to 2000. However, 94 property owners refused access for sampling and/or remediation.

Since the 2009 FYR, the PRP Group secured access for 76 of 94 (81%) residential properties. The results from soil sampling activities are contained in Environmental Works, Inc.'s (EWI's) Soil Sampling and Analysis Report, which the PRP Group submitted to EPA in January 2014. The results are discussed in the Data Review section below.

The Site PRP Group will prepare a Work Plan to conduct remediation at the remaining properties which exceed the cleanup level where the owner has granted access for the work. Current estimates are 48 properties which exceed the cleanup standard of 500 ppm lead in soil. This is discussed further below.

Furthermore, U.S. EPA is exploring the use of a neutral facilitator to approach the remaining 18 residences who continue to refuse access as an additional attempt to secure voluntary agreement from the residents. The facilitator will be utilized to approach the 18 remaining properties to obtain access for soil sampling and remediation, if necessary.

Other Areas where Battery Chips are Evident

In 2012, Madison Co. received a grant to install sewers under the streets in Eagle Park Acres. The work was contracted to several contractors. The soil and debris under the streets contained battery chips to varying degrees. The excavated contaminated soils were spread around the communities. U.S. EPA and IEPA characterized the areas where the soil was deposited. Based on those results, IEPA issued several notice of violation result letters to multiple parties requiring removal and proper disposal of the contaminated soils spread throughout the community. The violations that resulted from this matter have been resolved by IEPA under direction and authority of the IEPA, the contaminated soils were removed and properly managed.

Supplemental Environmental Project (SEP)

The Site PRP Group agreed to complete a supplemental environmental project (SEP) and it was embodied in the 2003 Consent Decree (CD). Although not part of the ROD, the SEP was negotiated as part of the CD with the PRP Group. The general goals of the SEP are to assess and abate hazards from lead-based paint within the Site boundaries. The paint SEP is funded with

\$2,000,000 for paint assessment and abatement at residences within the Site area. The PRP Group entered into an arrangement with the Madison County Community Development Agency (MCCDA) to conduct a lead based paint abatement program in Madison County. Under that provision, the PRP Group would conduct a SEP to address lead-based paint for those homes within the Site area which were at risk. U.S. EPA provides oversight of the paint SEP and has approved the SEP Work Plan. The PRP Group continues to implement the SEP. The last FYR review noted that the SEP was underway and required U.S. EPA to continue to monitor the SEP. A SEP Work Plan was issued to U.S. EPA in 2004 by the MCCDA and it was approved with modifications in 2004².

As part of the SEP work, the PRP Group prepared a master list of properties. A public kick-off meeting was held in Granite City in 2005 to announce the SEP. The MCCDA has actively sought participants for the lead-abatement program. For example, on February 1, 2006, an article was placed in the *Granite City Press Record* explaining the program and requesting applicants. Also, one of the MCCDA lead program staff members helped at a school registration in the Madison School District and handed out promotional items, and the MCCDA developed door hangers to place on the doors of the homes in Granite City, Madison and Venice. The MCCDA continues to seek additional applicants for participation in the SEP and continued to perform the SEP for applicants who had been accepted into the program. U.S. EPA will continue to monitor the SEP under the terms of the CD and attain a multi-media cleanup at the Site. Several extensions of time were agreed to by U.S. EPA to complete the SEP under the March 20, 2003 CD. In March 2014, U.S. EPA extended the date by three years for the period of time for completion of the SEP for the Site. The current completion date for the SEP is March 8, 2017.

The PRP Group issues periodic progress reports to U.S. EPA documenting SEP efforts and expenditures. On the PRP Group's behalf, the MCCDA continued to implement the SEP during the period from March 2009 through December 2013, and MCCDA completed lead paint assessments at 40 residential properties and performed lead paint mitigation and clearance activities at 41 residential properties within the boundaries of the Site. For the SEP to date (2005 – December 2013), MCCDA has completed lead paint assessments at 118 residential properties and lead paint mitigation activities and clearance activities at 115 residential properties. MCCDA representatives met with the Mayor of Granite City, attended health fairs, and performed other public outreach activities to encourage additional property owners to participate in the SEP. The PRP Group submitted MCCDA's SEP reports to U.S. EPA on a periodic basis to document the work performed by MCCDA.

Institutional Controls

Institutional controls (ICs) are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. ICs are required by the ROD and other decision documents although the specific types of ICs were not designated therein. Compliance with the ICs is required to assure long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure (UU/UE). A summary of the implemented and planned ICs for the Site are discussed below and summarized in Table 3. Maps showing the area in which the ICs apply is included in the ICWP

² In March 2007, U.S. EPA issued a clarification letter to the PRP Group regarding soil sampling protocols, soil remediation procedures and the possibility of expanding the scope to increase participation in the program.

(see Appendix J).

The industrial portion of the Site is zoned for industrial uses. The main industrial property consists of approximately 16 acres that formerly contained the lead acid battery recycling and secondary lead smelting facility (formerly NL Industries/Taracorp, now Metalico of Illinois, Inc. and Taracorp, Inc.); the waste pile from the Saint Louis Lead Recyclers (SLLR) recycling operation; an area formerly operated by BV&G Transport, now owned by the NL Industries Generator Site PRP Group, L.L.C.; and an area formerly owned by Rich Oil, a fuel oil distributor. The remedy called for cleanup of the industrial areas to an industrial cleanup standard of 1000 parts per million (ppm) lead and containment of the piles. The piles were consolidated into the existing Taracorp pile and covered with an engineered RCRA-grade cap.

The adjacent residential areas include approximately 500 acres within the cities of Granite City, Venice, and Madison, Illinois. The clean-up standards selected for the former smelter property, the alleys and Slough Road are based on commercial/ industrial standards, except the pile which required containment. The selected standards for the soil at the residences are based on unlimited use for the residential areas.

Access controls in the form of fencing and warning signs are in place at the Taracorp pile. These controls, along with the continued presence of Metalico (current owner of the former smelter property) employees at the Site, are effective measures to limit access to the Taracorp pile.

Because the remedy at the Site will not allow UU/UE for various areas, ICs are required to minimize the potential for human exposure to the hazardous substances and to protect the integrity of the remedy. The areas that require ICs are as follows: 1) the main industrial portion of the Site which includes the capped Taracorp pile, 2) certain adjacent residential areas that refused access, and 3) the remote fill areas.

As of the time of the remedial action close out, approximately 1,600 residences were cleaned up to the residential cleanup standard of 500 ppm lead which would allow unlimited use and unrestricted exposure. However, 94 residences refused access to either sample or remediate properties which were above the cleanup standard. Since the 2009 FYR, 76 additional residences have agreed to allow access for sampling and cleanup activities. Therefore, 18 residences remain who have refused access.

The remote fill areas include properties in Venice and the Eagle Park Acres subdivision, where battery casing materials containing lead (also known as chips) were used to fill low lying areas. The remote fill areas include most of the alleys in Venice Township (south and southeast of Madison), Slough Road, several locations in Granite City, and one area in Glen Carbon.

In consultation with U.S. EPA and IEPA, under an approved ICWP, the PRP Group continues to develop a program for ICs at the Site, which includes:

- Environmental covenants (deed restrictions);
- A one-call notification program, including an excavation advisory, to be implemented through JULIE, the Illinois one-call notification system;
- An ordinance for the Venice roadways;
- Communication Plan for the Venice roadways;
- Biennial notification letters to certain property owners; and
- Revision of the ICWP.

Table 3: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Taracorp Pile	Yes	Yes	Contained in approved IC Work Plan (ICWP)	Performance Standard: Containment. Objectives: Prohibit interference with cap (except proper maintenance); prohibit residential use of property including capped area; prohibit groundwater use	UECA ³ (planned)
Groundwater (site-related contamination found in area where pile resides and confined to industrial portion of the Site)	Yes	Yes	Ensure no additional wells are installed at Site and ensure groundwater contamination does not migrate off the property	Remedy Performance Standard: Attenuation until MCLs are reached. Objectives: Restrict / Prohibit groundwater use and installation of additional wells	UECA (planned)
Trust454/ BV& G Transport/ Rich Oil Properties /	Yes	Yes	Contained in approved ICWP	Remedy Performance Standard: 1000 ppm lead in soil for industrial uses. Objective: Maintain levels below 1000 ppm; Limit property to commercial/	UECA (planned)

³ The State of Illinois passed the Uniform Environmental Covenants Act (UECA) at 65 ILCS Ch. 122, the parties have agreed to use the UECA for preparation of ECs. Model covenants have been prepared by U.S. EPA and IEPA and have been used by the PRP Group in drafting the ECs.

				industrial use and ensure proper management of any disturbed material. Prohibition on use of groundwater.	
Alleys in Venice and Eagle Park Acres where crushed hard rubber battery "chips" were paved over.	Yes	Yes	Contained in approved ICWP	Remedy Performance Standard: Containment. Objectives: Prohibit interference with cap (except proper maintenance); prohibit residential use of property; prohibit groundwater use.	Governmental IC: Ordinance (planned; a draft presented to Mayor of Venice for review by the City)
Slough Road ⁴ where crushed hard rubber battery "chips" were paved over and areas where stray chips are evident.	Yes	Yes	Contained in approved ICWP	Ensure no inappropriate exposure or disposal of materials.	UECA (planned) Also, the parties are exploring the use of Governmental IC (i.e., ordinance) and Informational IC (i.e., One-Call Notice) and Appropriate Management Practices (AMPs) for management of battery "chips".

⁴This road is where crushed hard rubber battery case material and "battery chips" were used to fill low lying land. The battery chips are contaminated with lead. The main concern is direct contact and ingestion. In the past, Slough Road was an access point for a very small and isolated commercial/residential subdivision. A tavern remains at the entry point of Slough Road, but it appears to be infrequently open or patronized. All other building structures along Slough Road have been demolished. Because the road was in a state of disrepair, the RA required that it be paved as a cap to prevent exposure to the battery chips. However, paving made it easier for open dumping to occur. To prevent the open dumping, access was further restricted by placement of large concrete pieces at the access point to prohibit access. Discussions have been on-going with the property owners to implement deed restrictions to limit the uses to commercial/industrial uses.

Residential Properties where no cleanup or sampling were done in cleanup areas because access for sampling or cleanup was refused or no response was received by U.S. EPA or the PRP Group.	Yes	Yes	Contained in approved ICWP	<p>Remedy Performance Standard: 500 ppm lead in soil for UU/UE or residential uses.</p> <p>Objectives: Prevent utilization of areas for residential purposes unless below 500 ppm; prevent contamination from moving to non-contaminated areas.</p>	Attempting to clean-up properties, otherwise consideration is being given to use of various ICs such as informational ICs (i.e., biennial notification and placement of property on one-call system).
Sand Road ⁵ (Areas where hard-rubber battery "chips" may have been left in place at a depth of 3 feet).	Yes		Contained in approved ICWP.	<p>Remedy Performance Standard: Proper management of "chips" if encountered.</p> <p>Objectives: Inform property users of AMPs.</p>	Consideration is being given to use of various ICs such as informational ICs (i.e., biennial notification and placement of property on one-call system).
Schaeffer Road (Areas where documentation indicated that hard-rubber battery "chips" may have been left in-place at a depth of 3 feet).	Yes		Contained in approved ICWP.	<p>Remedy Performance Standard: Proper management of "chips" if encountered.</p> <p>Objectives: Inform property users of AMPs.</p>	Same as above.
Areas where hard-rubber battery "chips" are evident in Venice and Eagle Park Acres	Yes	Under Review	Contained in approved ICWP.	<p>Remedy Performance Standard: Proper management of "chips" if encountered.</p> <p>Objectives: Inform property</p>	Consideration is being given to the use of governmental IC (i.e., ordinance) and Informational IC (i.e., One-Call Notice) and AMPs for management of soil which contains the battery "chips."

⁵ EPA previously cleaned approx. 80 acres and left some chips in place below 3 feet. However, those areas were not well documented.

				users of AMPs.	
Residential Properties where cleanup was performed.	No	No	Contained in approved ICWP.	Remedy Performance Standard: 500 ppm lead in soil for residential uses or UU/UE. Objectives: Prevent recontamination.	No IC anticipated. SEP instituted to address lead paint which may impact property.
Other areas where battery-chips have been found.	No	No	Will be addressed in a modified IC Work Plan.	Ensure AMPs	Consideration is being given to inclusion of areas in the One-Call System.
Gardens in communities	No	No	unknown	EPA policy regarding "Technical Review Workgroup (TRW) for Lead Committee Recommendations Regarding Gardening and Reducing Exposure to Lead-Contaminated Soils".	Consideration is being given to referral to Madison County Health Department to incorporated into existing lead information program.

Maps showing the areas in which the ICs apply are included in the approved ICWP (See also Appendix J).

All required ICs are not yet in-place. Effective ICs must be implemented, monitored, maintained and enforced. Long-term stewardship must also be assured. The ICWP addresses the IC work which remains. This work includes preparing multiple ICs for properties at the Site; reviewing title work; planning for additional ICs that are needed. Further the ICWP includes a provision regarding preparation of a LTS plan for monitoring, maintenance, and enforcement procedures to ensure that effective ICs are in place and remedy components protected and includes a communication plan. The ICWP has been approved by U.S. EPA and the components in it are in varying phases of implementation. However, based on new information, additional areas will likely need ICs; therefore, U.S. EPA will review the decision documents to determine if the remedy needs further clarification. Also, the ICWP will be updated.

Current Compliance with Intended Use Restrictions:

Industrial Site Area: According to inspections of the industrial portion of the Site, there is no current use of the waste pile/landfill. Industrial uses on adjacent parcels are not anticipated to impact the waste pile. The hazardous waste cap must remain in place indefinitely to prevent exposure to underlying waste.

Groundwater: The property is currently zoned for industrial use and is being used for commercial/industrial purposes. Based on inspections and past sampling activity, the groundwater contamination remains within the industrial area and access to that area is limited. Additional groundwater sampling activities are scheduled for April 2014.

Residential Yards: Eighteen residences remain that have refused access for sampling and any needed cleanup. Please refer to the Remedy Implementation Activities section. U.S. EPA is exploring the use of a neutral facilitator to approach the remaining 18 residences as an additional attempt to secure voluntary agreement from the residents to obtain access for soil sampling and remediation, if necessary. Should access continue to be denied, informational or other ICs will be considered and implemented as appropriate.

Long Term Stewardship (LTS): Long-term protectiveness at the Site requires compliance with use restrictions to assure the remedy continues to function as intended. Since compliance with ICs is necessary to assure the protectiveness of the remedy, planning for long-term stewardship (LTS) is required. LTS involves assuring effective procedures are in place to properly maintain and monitor the Site. Long-term stewardship will ensure that the Site remedy including effective ICs are maintained and monitored so that the remedy continues to function as intended. The LTS plan is part of the ICWP, and includes provisions for an annual certification to U.S. EPA that ICs are in place and effective; the development of a communications plan; and the use of the State's one call system for certain areas. The Group has investigated the use of the Illinois one-call system, J.U.L.I.E., as an informational IC. To that end, the PRP Group has had discussions with representatives of Consolidated Utilities Services, Inc. and e-Locate Services, LLC related to the potential feasibility of including some of the properties associated with the Site in the one-call program. An excavation advisory has been prepared and is included in Appendix H. The PRP Group prepared an excavation advisory, under direction of U.S. EPA and IEPA, for some of the areas that are likely to have battery chips remaining and -which will be used in conjunction with the one-call notification program. The PRP Group provided maps to U.S. EPA that had been prepared by J.U.L.I.E., the Illinois one-call center, to show the properties that will be part of the one call notification program for the Site. The maps were prepared using GPS coordinates.

System Operation/Operation and Maintenance Activities

During the period from March 2009 to January 2014, the PRP Group continued to perform operation and maintenance (O&M) activities. O&M maintenance inspections were performed on a semi-annual basis at the site. Based upon the results of those inspections and other observations at the site, the PRP Group and its contactor, Munie Greencare Professionals, performed the following maintenance activities at the site on an as-needed basis:

- Vegetation was mowed on the Taracorp pile and surrounding areas at the main industrial site;

- herbicide was applied to control the growth of vegetation on and near the perimeter security fence at the main industrial site;
- the perimeter security fence was repaired;
- vegetative debris was removed from the concrete surface water drainage swale around the Taracorp pile;
- potential erosional areas on the cap of the Taracorp pile were addressed; and
- other miscellaneous maintenance activities were performed.

O&M activities were documented in reports submitted periodically to U.S. EPA. A copy of the O&M report submitted in fall 2013 is shown in Appendix E.

III. FIVE-YEAR REVIEW PROCESS

Administrative Components

The PRP Group was notified of the initiation of the FYR in November 2012. The NL/Taracorp Superfund Site FYR was led by Sheri L. Bianchin of the U.S. EPA, Remedial Project Manager for the Site and Janet Pope, the Community Involvement Coordinator (CIC). Doyle Wilson and Tom Miller of the IEPA assisted in the review as the representatives for the support agency.

The review, which began in November 2012 consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Notification and Involvement

Activities to involve the community in the FYR process were initiated with a meeting in August 2013 between Sheri L. Bianchin, Remedial Project Manager (RPM) and Janet Pope, Community Involvement Coordinator (CIC) for the Site. A notice was published in the local newspaper, the "*Granite City Journal*", on 10/30/2013, stating that there was a five-year review and inviting the public to submit any comments to the U.S. EPA. See Appendix C. The results of the review and the report will be made available at the Site information repository located at the Granite City Hall Clerk's office at 2000 Edison Ave, Granite City, IL and on U.S.EPA's website located at: <http://www.epa.gov/region5/cleanup/nltaracorp/index.html>.

Document Review

This FYR consisted of a review of relevant documents including O&M records and monitoring data. Applicable soil cleanup standards, as listed in the RODs and ESDs, were also reviewed.

Data Review

Soil Sampling

During 2009 and 2010, the Site Group developed an IC Work Plan (ICWP), in consultation with

U.S. EPA and IEPA. The ICWP also included a provision for additional soil sampling at residential properties within the boundaries of the Site where the property owners had previously denied access. U.S. EPA, IEPA, and members of the PRP Group participated in a meeting with the mayors of Granite City, Madison, and Venice and conducted other public relations activities related to the proposed soil sampling activities.

After U.S. EPA approved the PRP Group's ICWP, the Group and its consultant, EWI, initiated efforts (mailing letters, telephone calls, door-to-door contacts and providing pamphlets, and related activities) to obtain access from the owners of 94 residential properties. As signed access agreements were received from the property owners, EWI performed soil sampling activities on the PRP Group's behalf at the residential properties in April-May 2011, September 2012, June 2013, and October 2013.

The final version of Section 9 of the ICWP, including the soil sampling procedure, was approved by U.S. EPA in March 2011. Sampling and analysis were completed as defined within the ICWP. Pursuant to the ICWP, the PRP Group and EWI obtained access from 76 property owners (1 property was not sampled because it was determined to be a commercial property) and sampled soil to determine the lead concentrations at 73 properties (reported as 71 properties due to combined parcels) of the 84 denied access properties (where the property owners had previously denied access during remedial activities), 9 SEP properties, and 1 additional property. Of those properties where access was granted, EWI performed soil sampling activities on April 11-May 19, 2011, September 19-20, 2012, June 10-11, 2013 and October 9, 2013. A total of 831 soil samples, 41 field duplicate samples, and 25 field blanks were submitted to the laboratory for total lead analysis.

The PRP Group has completed access efforts and soil sampling activities for 76 of 94 residential properties. The results from soil sampling activities, which are summarized on Table 2 in Appendix G, includes EWI's Soil Sampling and Analysis Report, which the PRP Group submitted to U.S. EPA in January 2014. That report includes the current information regarding the soil sampling performed at the remaining residential properties.

Of the 94 properties (listed in Tables 1-3 of EWI report attached in Appendix G), soil sampling was conducted by EWI at 76 properties to date. Large-scale insets showing the 94 properties are provided on Figures 3a through 3e. Based on the analytical results, 34 properties (addressed in this report as 32 properties because the properties at 818/820 Madison Avenue were combined and the properties at 2410/2412 West 20th Street were combined, due to conditions at the properties) meet the requirements set forth in the ICWP for remediation (see Section 6) and 16 property owners have been referred to the MCCDA potential drip zone soil remediation as part of the SEP. The findings of the 2011, 2012 and 2013 sampling events include the following:

- Twenty-three properties exhibited total lead concentrations below 500 mg/kg in all the soil samples collected at each property.
- Forty-eight properties had soil lead concentrations in one or more samples that exceeded the 500 mg/kg remedial action objective. Of those, 16 properties had soil lead concentrations above 500 mg/kg in the drip zone samples only. For these properties, no remedial action is required as lead in drip zone samples may be attributable to factors other than the former industrial operations at the Site (the owners of those properties have been referred to the MCCDA for possible consideration as part of the MCCDA's Lead

Program). 32 properties had soil lead concentrations above 500 mg/kg in one or more samples in the yard or quadrant samples.

- Six properties of the 32 with soil lead concentrations above 500 mg/kg currently have an access agreement status of "soil sampling only".

The total estimated volume of soil for excavation at the 32 properties is 1,315 yds³. If access is not obtained for remediation at the six properties where access has been received for "soil sampling only," the volume of soil to be excavated at the remaining properties is 1,168 yds³.

Groundwater and Leachate Monitoring Activities

Groundwater monitoring is required to be conducted every five years. More frequent monitoring is not required since the metals in the groundwater have been found not to be very mobile. Also, the capping of the Taracorp pile has prevented on-going releases to the groundwater. The goal of the groundwater monitoring is to verify that lead in groundwater is continuing to attenuate as expected and to verify that contamination has not migrated beyond the Site boundary.

The PRP Group planned on conducting the required groundwater monitoring activities in conjunction with the fourth FYR. The PRP Group submitted a Groundwater Monitoring Work Plan to conduct groundwater activities in 2013 and the Work Plan was approved by U.S. EPA. The activities were planned to be conducted in February; however, due to extreme weather the groundwater monitoring event was postponed. The work is now scheduled for April 2014. U.S. EPA will examine the results when the quality assured data is submitted.

The last groundwater monitoring event occurred in 2009. In 2009, groundwater wells were sampled at the former smelter property in conjunction with the third five-year review to determine if the contamination in the groundwater was stable and contained under the former smelter property pursuant to an approved work plan. Based on the last groundwater monitoring event, sampling was performed at 17 wells which are part of the monitoring network. The location of the monitoring wells are shown on Figure 1 (attached). Attached is a data table which summarizes the groundwater data from the FYR groundwater monitoring event conducted in 2009 at the former smelter property. The data table also includes a historical summary of groundwater data for each monitoring well (See Exhibit I). Based upon the last groundwater monitoring event, it has been determined that groundwater contamination continued to be confined to the former smelter property. Sampling in April of 2014 will confirm whether that continues to be the case.

Additionally, leachate monitoring will be conducted in April 2014 along with the groundwater monitoring. More frequent monitoring is not required since the wastes in the Taracorp pile are not conducive to leachate production. Part of the FYR monitoring requires that the leachate collection system be monitored to determine if any leachate is present. In 2009, approximately 50 gallons of leachate were pumped and discharged from the collection system to the sanitary sewer with permission from the Granite City Wastewater Treatment Plant. The leachate was discharged into the sanitary sewer in February 2009 following receipt of the City's authorization. This will also occur in the spring of 2014.

O&M Progress Reports

The PRP Group has continued to submit progress reports to U.S. EPA on a quarterly basis as required by the Consent Decree. A copy of the most recent report is included as Appendix F.

Recontamination Studies

A subset of yards adjacent to the yards where access was refused were sampled to determine if the clean yards had been recontaminated by the unremediated yards as part of the FYR monitoring to assess whether recontamination with lead from yards where residents refused access or other sources may be occurring.

The only contamination found above the cleanup standards was found in the paint "drip zone" for two properties. The paint drip zone is a small soil area surrounding a structure, such as a house, where lead paint from the structure has contaminated the soil. That contamination is not related to the Site and will be referred for the SEP work. U.S. EPA will consider continuing to periodically (such as during the FYRs) require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue. U.S. EPA will also periodically check the residences with the highest lead concentrations that were not remediated due to access refusal (there are nine of them) to see if the owners have reconsidered their access refusal or if new property owners would like to have the properties cleaned up, and take action as appropriate.

Site Inspection

The inspection of the Site was conducted on November 6, 2013. In attendance were Sheri L. Bianchin, RPM, U.S. EPA; Doyle Wilson and Tom Miller of IEPA, representatives of the support agency; and representatives from the PRP Group who were Kate Whitby, Esq.; Jeff Leed, Project Coordinator; Leed Environmental; and Ben Graw, Esq. The inspection roster depicting the list of attendees is found in Appendix E. The purpose of the inspection was to assess the protectiveness of the remedy. The inspection findings confirmed that the remedy at the Site is in compliance with the requirements of the ROD and ESDs.

During the FYR inspection, Slough Road was found to be inaccessible because of the concrete barriers. However, battery chips were noted to be disbursed in the nearby parking area leading to the road and tavern. There was no evidence of exposure to the chips and the likelihood is small since some of the chips were dispersed away from the capped area and there was no evidence that the road is frequented by visitors. However, to assure that no unanticipated exposures to the chips are occurring, following this review, consideration will be given by U.S. EPA and the PRP Group to additional actions such as removal or capping, and/or placing additional restrictions, or placement of conspicuous notices.

The integrity of the covering/caps for the alleyways was good. There is no evidence of exposure from the battery chips from the alleys. In one place (i.e., back of pile), the fence surrounding the Taracorp pile was leaning slightly. Also, the warning signs were no longer evident on the fence. The FYR checklist is attached as Appendix E along with the inspection roster and Site photographs from the inspection.

Interviews

U.S. EPA's Project Manager maintains regular communication with PRP Group's Site Project Manager Jeff Leed, Leed Environmental and IEPA regarding the site O&M and monitoring and implementation of ICs and SEP follow-up. Additionally, monthly meetings have been held between representatives of the PRP Group, U.S. EPA and IEPA.

No specific community interviews were conducted during the FYR process. However, some of the Site team met with Mayor Echols of Venice on November 7, 2013. Representatives from IEPA, U.S. EPA and the PRP Group presented Mayor Echols with a draft ordinance to enact as part of the ICWP. Mayor Echols was positive about the ordinance. He informed the participants of the meeting that the draft Ordinance would go through legal review shortly and that he would get back to the PRP Group, U.S. EPA, and IEPA. However, to-date, we have not yet heard back.

IV. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents? Yes

Remedial Action Performance

The remedial actions described in the decision documents have been implemented and the clean-up objectives have been met. During the remedy selection process, the primary exposure pathway identified at the Site was direct contact and ingestion of lead-contaminated soil and dust, and the secondary pathway was inhalation of fugitive dust from the Taracorp pile. Based on the visual observations and the monitoring, the remedy has been effective in addressing the primary exposure pathway. There were several yards that were sampled that had recontamination with lead in the drip zone of the house, a pathway that would likely be associated with lead-based exterior paint. Although not required by the ROD, the SEP to address paint issues in the Site area will be monitored by U.S. EPA to ensure that these homes with high lead concentrations in the drip zone are assessed and addressed, as necessary. The inspections of the cap in November 2013 on the Taracorp pile by U.S. EPA and IEPA indicate that the cap is in good condition, thus preventing the generation of fugitive dust lead which is generated by blowing off an uncovered waste pile. However, as mentioned, warning signs were needed for the perimeter fencing which is located around the pile. Also, one area of the fencing requires repair since apparently a mishap at the facility behind the pile (the Metallico facility) damaged the fencing in one area.

Inspections are conducted at least twice per year. These inspections indicate that the remedy has been effective in addressing the secondary exposure pathway.

Last, groundwater must be monitored by the PRP Group during each five-year review process to verify that the lead, cadmium, and zinc in the groundwater in the vicinity of the Taracorp pile has not migrated further. Groundwater monitoring is not needed more frequently because the metals of concern in the groundwater for the Site tend to be quite stable and not mobile. In the past, the levels of these constituents generally decreased in the wells adjacent to the Taracorp pile, which is expected since the cap diverts most of the runoff away from the pile. U.S. EPA approved the five-year review groundwater monitoring event; however, due to the weather, the work was rescheduled several times. Currently, the work is scheduled for mid-April. Results will be available soon after that.

In summary, the data gathered during this fourth FYR indicates that the remedy continues to function as designed, is performing as expected, and that the containment of contaminants is effective.

System Operation and Maintenance (O&M)

The remedy for the Site does not include any operating systems. The Site is inspected at least twice per year. Maintenance and repairs are taken care of as needed. For example, site inspections to assess the integrity of the cap are conducted and repairs made, as needed. These inspections have been and will continue to be an effective means to ensure the cap integrity and other site areas. See copy of a recent report in Appendix F.

Progress Reports

The PRP Group has continued to submit progress reports to U.S. EPA on a quarterly basis as required by the Consent Decree. The report includes a summary of all work done under the Consent Decree. A copy of the most recent report is included as Appendix F.

O&M Costs

It was reported that the NL Industries/Taracorp Superfund Site PRP Group's annual operation and maintenance costs for the period from 2009 to 2013 are approximately \$10,000 to \$12,000 per year. These costs have not substantively changed from the previous five-year reporting period.

The annual operation and maintenance costs for 2009 to 2013 include: semi-annual operation and maintenance inspections and reporting; mowing vegetation at the main industrial portion of the site; removing vegetation (trees, bushes, etc.) from the fence at the main industrial portion of the site; fence repairs at the main industrial portion of the site; occasional removal of trash, debris, etc. from the main industrial portion of the site; and project coordination work related to operation and maintenance activities. The annual operation and maintenance costs for 2009 to 2013 do not include: legal costs; groundwater or soil sampling costs; SEP expenses; institutional controls costs; or project coordinator costs (except those related to operation and maintenance).

Opportunities for Optimization

Since there are no operating systems at the Site, there are limited opportunities for optimization of the O&M.

Early Indicators of Potential Issues

Since there are no operating systems at the Site, the only early indicators of potential issues would be increasing lead concentrations in the residential yards that were cleaned up, finding new sources of lead from the Site, observations of breeches in the cap, changes in the quantity and/or chemical composition of the leachate from the pile, or increases in the area and/or contaminant concentrations in the groundwater plume. The data collected for the FYR indicate that none of these issues are currently present except finding new sources of contamination and addressing the properties who have refused access. There was recontamination of the drip zones

of several of the homes, and although not required by the ROD, U.S. EPA will refer these homes for the SEP work.

Implementation of Institutional Controls and Other Measures

Access controls in the form of fencing are in place at the Taracorp pile. These controls, along with the continued presence of Metalico (current owner of the former smelter property) employees at the site, are effective measures to limit access to the Taracorp pile. However, warning signs need to be re-established. The ROD requirement for deed restrictions on the Taracorp pile has not yet been implemented, so U.S. EPA will continue to work with the PRP Group to ensure that these restrictions are put into place. U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue. U.S. EPA will also periodically check the residences with the highest lead concentrations that were not cleaned up due to access refusal (there are nine of them) to see if the owners have reconsidered their access refusal or if new owners would like to have the properties cleaned up, and take action as appropriate.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy section still valid? Yes.

Changes in Standards and To Be Considered Criteria

There have been no changes in standards or To Be Considered criteria since the third FYR. The Office of Solid Waste and Emergency Response (OSWER) still recommends using the Integrated Exposure Uptake Biokinetic Model (IEUBK model) as a risk assessment tool to support environmental cleanup decisions for residential scenarios at CERCLA sites and at Resource Conservation and Recovery Act (RCRA) Corrective Action sites (U.S. EPA, 1994a, b). That was done for this Site and based on site-specific factors and using the current lead models, U.S. EPA determined the cleanup levels from lead in soils to be 500 ppm for residential uses and 1000 ppm for commercial uses.

However, on December 13, 2013, U.S. EPA published guidance (OSWER) entitled "*Technical Review Workgroup (TRW) for Lead Committee Recommendations Regarding Gardening and Reducing Exposure to Lead-Contaminated Soils*". The document can be accessed on the EPA website at: <http://epa.gov/superfund/lead/guidance.htm>.

This guidance prepared by the TRW was developed due to numerous requests from communities near Superfund sites and Brownfields regarding the safety of gardening and eating vegetables in lead-contaminated soil. This document provides an overview of exposure to lead while gardening and consuming home-grown produce, and, based on currently available information, to provide Best Management Practices (BMPs) for gardening in lead contaminated areas to reduce lead exposure from contaminated soil. The benefits of home produce is widely known; however, there is a lack of information regarding the potential route of exposure to lead-contaminated soil. It also identifies data gaps and uncertainties in the identified literature.

U.S. EPA, IEPA and the PRP Group will review the guidance to determine if the findings and recommendations will affect the remedy at the Site. Minimally, contact will be made with the MCCDA to determine if the AMPs can be incorporated into its current lead program.

Changes in Exposure Pathways

Evidence of dispersed battery chips have been found beyond the capped area at Slough Road and in other areas which were not previously identified such as under the roads in Eagle Park acres. Although U.S. EPA does not believe that it affects the protectiveness of the remedy since there is no evidence that exposures are occurring, actions will be considered to address it under the Work Plan. There have been no other changes in the potential exposure pathways at the Site since the implementation of the remedy for the Site. There have been no land use changes at the Site nor are any expected in the near future. There is currently no redevelopment or reuse proposed for the Taracorp pile.

Changes in Toxicity and Other Contaminant Characteristics

Neither the toxicity factors for the contaminants of concern, nor other contaminant characteristics have changed in a way that could affect the protectiveness of the remedy. The primary contaminants of concern for the Site (i.e., lead and other metals) are basically inert.

Changes in Risk Assessment Methods

Standardized risk assessment methods have not changed in a way that could affect the protectiveness of the remedy. See also discussion above regarding gardens.

Expected Progress Toward Meeting Remedial Action Objectives

The remedy for the Site is progressing as expected. Remedial Action Objectives have been met at the Site, and the monitoring programs will continue to ensure that any changes in contaminant levels will be detected and addressed, if necessary. The only issues are that 18 out of 1,600 property owners have not yet agreed to allow access for sampling or remediation. Also, additional battery chips have been found in the community.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No

Evidence of dispersed battery chips have been found beyond the capped area at Slough Road, Sand Road and other areas of Eagle Park Acres. Although U.S. EPA does not believe that it affects the protectiveness of the remedy since there is no evidence that exposures are occurring, actions will be considered to address it under the ICWP. There are no other newly identified ecological risks, impacts from natural disasters, or any other information that has been identified that could affect the protectiveness of the remedy for the Site.

Technical Assessment Summary

The review of documents and data, along with the information gathering during the FYR process indicate that the remedy has performed as anticipated in the decision documents. Threats posed by the waste materials left in the pile have been addressed through the cap and on-going

maintenance. However, additional work is required to ensure that the remedy remains protective in the long-term.

V. ISSUES/RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 4: Issues and Recommendations/Follow-up Actions

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
						Current	Future
1	1. Institutional Controls need to be implemented, monitored and maintained and enforced. Access controls / fencing requires repair and appropriate warning signage.	U.S. EPA will continue to work with the Group to implement the approved IC Work Plan and oversee implementation.	PRP Group and U.S. EPA	U.S. EPA and IEPA	3/31/2016	No	Yes
1	2. Ensure groundwater contamination, if any, has not migrated off the source property.	PRPs will complete groundwater monitoring according to approved work plan and take appropriate follow-up actions if needed.	PRP Group	U.S. EPA and IEPA	6/30/2014	No	Yes
1	3. Fencing and signage need to be monitored and repaired.	PRPs will monitor the fence around Taracorp pile to ensure it remains intact and complete repair of fencing, if needed, and installation of warning signage by Taracorp Pile.	PRP Group	U.S. EPA and IEPA	6/30/2014	No	Yes
1	4. Remedy Decision Documents may not be clear relative to ICs .	U.S. EPA will review Remedy Decision Documents to determine if clarifications are required regarding additional ICs. If so, provide appropriate documentation such as an Explanation of Significant Differences (ESD).	U.S. EPA/ IEPA	U.S. EPA	12/30/2016	No	Yes

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
						Current	Future
1	5. Prevent recontamination issues at residential yards.	U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup or near the Site so that recontamination, if it occurs, can be addressed before it becomes a potential health issue.	PRP Group	U.S. EPA/ IEPA	3/30/2019	N	Y

In addition to the above recommendations, continued implementation of the SEP is recommended.

VI. PROTECTIVENESS STATEMENT

Operable Unit:

1

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current unacceptable exposures; and the groundwater contamination is confined to the former lead smelter property. Further, the RA CD provides an additional measure of protection by requiring the implementation of a supplemental environmental project (SEP) to address lead based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site.

However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness. Effective ICs need to be implemented. Compliance with ICs needs to be ensured by implementing long term stewardship procedures that maintain, monitor, and enforce effective ICs as well as maintaining the site remedy components. Groundwater monitoring needs to be implemented. Repairs to the security fence and placement of warning signs are needed. Last, U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue.

Sitewide Protectiveness Statement

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy at the NL Industries/Taracorp Lead Smelter Site currently protects human health and the environment because: the final remedy has been fully implemented (except at the residences that have refused access); the sampling data indicate that the remedy continues to be effective in addressing the exposure pathways that were identified at the Site; there is no evidence of current unacceptable exposures; and the groundwater contamination is confined to the former lead smelter property. Further, the RA CD provides an additional measure of protection by requiring the implementation of a supplemental environmental project (SEP) to address lead based paint issues in the Site area. This SEP helps to provide a multi-media cleanup that goes beyond the requirements in the ROD for the Site.

However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness. Effective ICs need to be implemented. Compliance with ICs needs to be ensured by adopting long-term stewardship procedures that maintain, monitor, and enforce effective ICs as well as maintaining the site remedy components. Groundwater monitoring needs to be performed. Repairs to the security fence and placement of warning signs are needed. Last, U.S. EPA will continue to require monitoring of residential yards that are adjacent to yards where the residents refused access for the cleanup so that recontamination, if it occurs, can be addressed before it becomes a potential health issue.

VII. NEXT REVIEW

The fifth FYR for the Site is required five years from the completion date of this review (i.e. March 2019).

Appendix A

Existing Site Information / History

Site Chronology

Physical characteristics, Geology, Hydrology, Land and Resource Use,
History of Contamination, Initial Response

Remedial Action

APPENDIX A – EXISTING SITE INFORMATION/ HISTORY

1. SITE CHRONOLOGY

The site chronology is tabularized below:

Event	Date
Final National Priorities List Listing	6/10/1986
Remedial Investigation/Feasibility Study complete	3/30/1990
Record of Decision	3/30/1990
U.S. EPA issued Unilateral Order to PRPs	11/27/1990
Remedial Design start (U.S. EPA-Lead)	3/08/1991
Remedial Design complete (U.S. EPA-lead)	3/15/1993
Remedial Action start (U.S. EPA-lead)	3/15/1993
Explanation of Significant Differences	3/31/1993
Explanation of Significant Differences	5/07/1993
Explanation of Significant Differences	1/27/1994
Decision Document/Explanation of Significant Differences	9/29/1995
Remedial Action Continues (PRP-Lead)	7/13/1998
First Five-Year review	3/31/1999
Remedial Action complete (PRP-Lead)	5/30/2000
Explanation of Significant Differences	9/19/2000
Preliminary Close-out Report	9/26/2000
Remedial Design/Remedial Action Consent Decree Entry	3/20/2003
Consent Decree Entry with NL Industries	5/13/2003
Second Five Year Review	3/30/2004
Third Five-year Review	3/30/2009

2. BACKGROUND

Physical Characteristics

The NL Industries/Taracorp Lead Smelter property in Granite City, Illinois is a former lead-acid battery reclamation facility and secondary lead smelter that operated from the early 1900s through 1983. The main industrial property is approximately 16 acres; however, the contamination was spread via stack emissions and fill activities throughout a three-city area (Granite City, Madison, and Venice, Illinois) and isolated areas in neighboring communities. A map of the Site is shown in Figure 2. Metals, including lead, were released to the environment via 1) airborne emissions from the tall stack on-site and fugitive dust from the on-site Taracorp pile" 2) crushed hard rubber battery casing material that was used as fill in nearby alleys, parking lots, driveways, and residential yards; and 3) groundwater contamination resulting from releases of metals from the Taracorp pile. The Site was proposed for the National Priorities List (NPL) on October 15, 1984. The Site was added to the NPL on June 10, 1986.

Land and Resource Use

The main industrial portion of the Site is bounded by 16th Street on the east, Niedringhaus Road to the north, a rail corridor to the west and State Street to the south (See Figure 1). However, the contamination was spread throughout Granite City, Madison, and Venice, Illinois and isolated areas in neighboring communities. The nearest residences are located immediately adjacent to the main industrial portion of the Site to the east, north, northeast, and south.

Regional Hydrogeology

The Site is approximately eight to ten miles south of the confluence of the Mississippi and Missouri Rivers. Granite City's municipal drinking water comes from the Mississippi River and does not appear to be affected by any contaminated groundwater. The Site is underlain by recent alluvium and glaciofluvial and glaciolacustrine deposits. Bedrock beneath the alluvium is carboniferous age rocks consisting of limestone, sandstone, and shale. The alluvium and glacial deposit which fill the valley range in thickness from less than one foot adjacent to the bluff boundary and the Chain of Rocks reach of the Mississippi River, to greater than 170 feet near the City of Wood River. The estimated thickness of the valley beneath the Site is approximately 100 to 120 feet. Investigations have concluded that the deposits become coarser with depth.

Generally, groundwater in the Granite City area occurs within the unconsolidated valley deposits under unconfined and leaky confined conditions. Recharge of groundwater within the area is from precipitation and induced infiltration of surface water from the Mississippi River and smaller surface water bodies in the area. Groundwater flow is relatively slow and regionally moves in the south/southwesterly direction. All residents in the area are hooked up to city water.

History of Contamination

Historically, secondary lead smelting, metal refining, fabricating, and associated activities were conducted at the NL/Taracorp Industrial property since the turn of the twentieth century to about 1988. Lead-acid battery recycling activities commenced during the 1950s. These operations produced extensive on-site and off-site contamination. Smelting activities resulted in lead air emissions that exceeded the National Ambient Air Quality standards (NAAQS) for lead during

the operation of the smelter. The main industrial portion of the Site is approximately 16 acres, but "the contamination was spread via stack emissions and fill activities throughout a three-city area (Granite City, Madison, and Venice, Illinois) and isolated areas in neighboring communities. Once the smelter was shut down, residual contamination of metals, primarily lead, was found to exist in various locations. Airborne metal (primarily lead) emissions from the facility's secondary smelting operations and fugitive dust from the on-site Taracorp pile was found in soils on residential and commercial/industrial properties; approximately 1,600 residences around the site contained lead levels in soil that exceeded the site-specific cleanup level. The furthest residences contaminated in this manner (i.e., lead deposited by smelter stack emissions) were located approximately two miles from the former smelter, to the northeast. Additionally, crushed hard rubber battery casing material (also known as chips) was sold or given away by NL Industries, and residents and local street crews used this material in alleys, parking lots, driveways, and to fill in some flood-prone areas which were ultimately developed into residential lots. The fill material was found as far as 16 miles away from the smelter property, but the majority was located within two miles of the smelter property. Additionally, residual metals contamination was found on the smelter property 1) near the former operations in the parking lot and road due to residual contamination from the process and 2) in a 3.5 acre waste pile consisting of slag, battery cases, and other debris on the main industrial property. Finally, residual ground water contamination was found in the immediate vicinity of the former battery breaker adjacent to the Taracorp pile.

The main risks posed by the metals contamination was from direct contact and ingestion of contaminated soils and waste materials. In 1993, cleanup began on the 1,600 residential properties contaminated with lead from smelter stack emissions and approximately 70 alleys, parking lots, and driveways where the crushed battery casing material was used as fill. All were completed except for approximately 84 properties in the cleanup zone where the owners refused access for sampling and/or remediation. The remedy for the Site was implemented from early 1993 through May 2000 pursuant to a March 30, 1990 Record of Decision issued by the U.S. U.S. EPA and several follow-up decision documents. In 1998, capping of the Taracorp pile began. The Site began remedial action as a fund lead Site and then the PRP Group took over in 1998. The majority of the work was complete by spring of 2000 and the Preliminary Close-Out Report was completed on September 26, 2000. On August 2, 2000, U.S. EPA conducted a pre-final inspection at the Site. The groundwater was not remediated because the metals were not migrating more than approximately 200 feet from the Taracorp pile. All residents in the area are hooked up to city water. All cleanup activities, with the exception of some residential properties where access was refused, were completed in 2000, and groundwater monitoring and Taracorp pile cap inspections continue to the present.

Taracorp Industries purchased the main industrial facility property from NL Industries, Inc., in 1979, and owned it until 1997. The battery recycling and secondary lead smelting operations generated an on-site pile of blast furnace slag and battery casing debris (i.e., the Taracorp pile). In 1981, St. Louis Lead Recyclers, Inc. (SLLR) began using equipment on adjacent property owned by Trust 454 to separate components of the Taracorp pile. SLLR attempted to recycle lead-bearing materials to the furnaces at Taracorp and send hard rubber and plastic offsite for recycling. Hard rubber was the end waste product of this recycling process. SLLR continued operations until March 1983 when it shut down its equipment. Residual lead-bearing waste materials from the operation remained on Trust 454 property, as did some equipment. In 1983, a State of Illinois study of the Granite City lead emissions problem linked emissions from the on-site lead smelter and reclamation operations at the

facility to the air pollution problem in the area. A State Implementation Plan for regulating air pollution sources in Granite City was published in September 1983 by the IEPA. The IEPA's Report indicated that the nonattainment status for lead air emissions in Granite City was in large part attributable to emissions associated with the operation of the secondary lead smelter operated by Taracorp and lead reclamation activities conducted by SLLR.

Additionally, because of concerns over lead contamination in the communities and a documented risk to public health from exposure to high levels of lead, the State of Illinois denied an application to continue operating the smelter. Secondary lead smelting operations were discontinued during 1983 and the equipment dismantled. Metalico, the current owner of most of the main industrial property, continues to perform metal refining at the facility. A 1991 blood lead study indicated that 16% of the children in Granite City, Madison, and Venice aged 6 months to 6 years had blood lead levels exceeding 10 micrograms per deciliter (ug/dl), the Centers for Disease Control level of concern at the time. Within one-quarter mile of the smelter, 25% of the children had blood lead levels in excess of 10 ug/dcl.

Taracorp continues to own the property where the large Taracorp pile is located. The other property owners for the former smelter property are the NL Industries Generator Site Group LLC (BV&G Transport), and State Street Warehouse (formerly Rich Oil and Trust 454).

Lead contamination from the Site came to be located in home interiors and surficial soils in many nearby residences, alleys, driveways, parks, and parking lots. Prior to the remediation, children in the area were impacted by the lead released from the Site.

Remedial Investigation (RI)/ Feasibility Study (FS)

NL, as former owner of the facility, voluntarily entered into an Agreement and Administrative Order by Consent with the U.S. EPA and IEP A in May 1985 to implement a RI/FS. The RI/FS work began in 1986, and the purpose of the RI was to identify the nature and extent of contamination at the Site and to determine any risks to the public health, welfare or the environment caused by the releases of contamination. The results are provided within the RI Report which also included a baseline risk assessment conducted to characterize the current and potential threats to public health and the environment at the Site.

The RI for the Site indicated the need to prevent direct contact and ingestion and inhalation of lead-contaminated soils and waste materials in the Taracorp pile, the SLLR piles, and the main industrial facility; residential soils contaminated by lead fallout from the smelter stack; and battery case material used as fill material for alleys, driveways, and other areas. Additionally, the RI indicated a need for further groundwater monitoring in the deeper zone of the upper aquifer and a mechanism for remediation of any contaminants in the groundwater that are detected in concentrations that would present an endangerment to public health and the environment.

The goals of the FS were to fully evaluate clean-up alternatives that can be used to remove, reduce or stabilize threats from contaminants at the Site. Seven different cleanup alternatives to address contamination were evaluated in the FS. The estimated costs of these remedies ranged from about \$500,000 for a no action remedy which included only monitoring and deed restrictions, to \$67 million which assumed all the contaminated soil and waste material in the Taracorp pile would be disposed off-site. Five of the remaining remedies involved removing and disposing of drums off-site, excavating lead contaminated soil and battery chips from residential properties and alleys and consolidating them with

the industrial lead pile, capping the pile and moving some of the soil to an off-site landfill and performing additional groundwater monitoring. For all the remedies requiring soil cleanup, NL Industries proposed that soil be cleaned up to 1,000 parts per million (ppm) lead for both industrial and residential properties.

NL Industries refused to develop an alternative for a residential cleanup level of 500 ppm lead. Hence, U.S. EPA developed such an alternative in an addendum to the FS. Following a detailed analysis of the alternatives by U.S. EPA, a Proposed Plan for remedial action was issued in January 1990.

Initial Response

In 1993, U.S. EPA and the U.S. Army Corps of Engineers performed a rapid response action at the Site to remove the most highly contaminated site areas, approximately 50 locations where battery casing fill material was located and readily accessible to children. This action was completed in 1994.

Basis For Taking Action

The primary exposure pathway identified during the RI/FS for the Site was direct contact and ingestion of lead-contaminated soil and dust by small children. Lead was identified as the primary contaminant of concern at the Site. There was a known blood lead problem in the communities near the Site. Inhalation of lead-bearing dust from the on-site Taracorp pile was an additional exposure pathway of concern. Although the groundwater in the immediate vicinity of the waste (slag/debris) pile was contaminated with lead, cadmium, and zinc. However, this exposure pathway was not considered to be complete because all of the residents consume potable water provided by the municipality. This is explained further in the section below.

3 . REMEDIAL ACTIONS

Remedy Selection

The Remedy for the Site is contained in various documents including a Record of Decision (ROD), a Decision Document reaffirming the ROD (the record was reopened per a court Settlement), and four Explanations of Significant Differences (ESDs). Based on the abovementioned remedy documents, which are discussed further below, the Remedial Action Objectives (RAOs) for the Site are a combination of achieving UU/UE in the residential areas, and containment in all other Site areas.

The first ROD was signed by the Regional Administrator on March 30, 1990, after taking into consideration all public comments. The cleanup decision embodied in the ROD addressed the Taracorp pile, the SLLR piles, and residential soil, alleys, and driveways that are contaminated by airborne lead and/or hard rubber battery casing material, groundwater monitoring .remedy selected a 500 ppm lead soil cleanup level for residential properties, and a 1,000 ppm cleanup level for industrial properties. More specifically, the ROD required excavation and off-site disposal of soil and fill material from residential yards, parks, schools, alleys, parking lots, and driveways that exceeded 500 ppm lead; excavation and consolidation with the Taracorp pile on the main industrial area soils and

debris that exceeded 1000 ppm lead; capping of the Taracorp pile; and expanded (deeper) groundwater monitoring around the Taracorp pile. The specific elements of the remedy are outlined in detail below.

The ROD also indicated that a blood lead study should be performed in the area around the Site. The remedy was modified slightly via the September 29, 1995, Decision Document Explanation of Significant Differences (DD/ESD). The DD/ESD required off-site monitoring and containment of the groundwater plume emanating from the Taracorp pile. After results of offsite monitoring indicated that the groundwater contaminant plume was not migrating more than approximately 200 feet from the edge of the Taracorp pile, U.S. EPA issued a second ESD on September 19, 2000 that removed the requirement for a groundwater containment remedy and required continuation of the expanded monitoring program and the development of a contingency plan in the event that the plume expanded in the future. Since the time the ROD was signed, it has been reopened once, and four ESDs have been issued.

The first ESD, signed on May 7, 1993, allowed for battery case material that was contaminated with greater than 500 ppm lead but was not hazardous per the Toxicity Characteristic Leaching Procedure (TCLP) test, to be disposed of at an off-site landfill rather than consolidated with the Taracorp pile, as originally specified in the 1990 ROD. During U.S. EPA's remediation of battery case material, which commenced in the spring of 1993, numerous additional battery case locations were discovered. Over 100 such locations were identified with lead concentrations exceeding 500 ppm including a large roadway termed Slough Road. Given this large increase in volume of battery case material to be remediated (e.g., 1990 ROD cost estimates were based on 18 locations), U.S. EPA decided to reevaluate the excavation and disposal remedy for the battery casting material contained in the 1990 ROD. The second ESD, signed on January 27, 1994, allowed for disposal of residential soils contaminated with greater than 500 ppm lead and that are not hazardous per the TCLP test at an off-site landfill rather than consolidated with the Taracorp pile, as originally specified in the 1990 ROD. This was also based upon an increase in the volume of soils to be dealt with and public opposition to increasing the size of the Taracorp pile. Next, as an agreement pursuant to a legal action brought by the PRPs and the City of Granite City to dispute the remedy, U.S. EPA reopened the ROD. This is discussed further in the section below on Enforcement History. On February 17, 1995, U.S. EPA released a Proposed Plan for remedy reconsideration. The Proposed Plan reaffirmed the 500 ppm residential lead soil cleanup level which was the primary concern of the PRPs. The Proposed Plan also reaffirmed the capping/containment remedy for the Taracorp pile which was the primary concern of the City of Granite City. Furthermore, in response to the recently detected groundwater contamination, U.S. EPA also included a groundwater remedy component in the Proposed Plan. Additionally, provisions that were not contained in the 1990 ROD were added, including the additional remote fill areas where crushed battery cases had been used for fill, and based upon a multi-media approach to the lead contamination problem, provided for making a High Efficiency Particulate Arrester (HEPA) vacuum available to residents in the cleanup zone for interior house dust cleaning, and paving a truck lot at 1420 State Street to prevent possible lead recontamination of nearby residential properties, among other provisions. On September 29, 1995, U.S. EPA issued the DD/ESD, which contained these additional components described in the Proposed Plan. The increased costs estimates for remediation were presented accordingly.

Finally, an ESD was issued in September 2000. Based on the installation of additional monitoring wells in March and June 2000, data collected indicated that the lead in groundwater does not migrate more than approximately 200 feet from the Taracorp pile where it is likely buffered by the chemistry of the

water and soil. Additionally, U.S. EPA anticipated that the concentration of lead in groundwater in the perimeter wells around the pile will decrease since the highly contaminated main industrial area soils were consolidated with the Taracorp pile and the pile was capped with a RCRA subtitle C, multi-layered cap in 1999. This consolidation and capping would divert precipitation away from the waste materials in the Taracorp pile and, thus, decrease the amount of lead leaching from the pile and other areas of the main industrial area in the future. Collectively, this information indicated that groundwater contamination at the Site is very limited and will likely decrease even further in the future. Hence, the September 2000 ESD required that monitoring be continued and that a contingency plan be implemented if groundwater contamination increases above acceptable levels, rather than the installation of a groundwater containment system at the Site.

The Final Selected Remedy

The components of the remedy as specified in the Record of Decision (ROD) dated March 30, 1990; ESD dated May 7, 1993; ESD dated January 27, 1994; the *DD/ESD* dated September 29, 1995 and the ESD dated September 2000 are:

- ✓ Installation of an upgraded security fence around the expanded Taracorp pile;
- ✓ Deed Restrictions and other institutional controls to prevent access to the Taracorp Pile;
- ✓ Performance of soil lead sampling to determine which areas must be excavated and the extent of the excavation;
- ✓ Inspection of alleys and driveways and areas containing surficial battery case material in Venice, Eagle Park Acres, Granite City, Madison and any other nearby communities to determine whether additional areas not identified in the Feasibility Study must be remediated as described below;
- ✓ Performance of blood lead sampling to provide the community with current data on potential acute health effects associated with Site contamination;
- ✓ Installation of a minimum of one upgradient and three downgradient deep wells, monitoring of groundwater and air, and inspection and maintenance of the cap;
- ✓ Removal and recovery of all drums on the Taracorp pile at a secondary lead smelter;
- ✓ Consolidation of waste contained in adjacent SLLR piles with the Taracorp pile and construction of a new cell with an engineered RCRA grade liner and leachate collection system;
- ✓ Excavation and consolidation with the Taracorp pile of all unpaved portions of the adjacent Trust 454, Rich Oil, and BV &G Transport properties with lead concentrations greater than 1000 ppm;
- ✓ Excavation and consolidation with the Taracorp pile or off-site disposal of all residential soils and battery case materials in Granite City, Madison, and Venice, Illinois, and any other nearby communities with lead concentrations greater than 500 ppm;

- ✓ Consolidation of the soils and crushed casings and lead contaminated materials from the adjacent waste piles into the existing Taracorp waste (slag/debris) pile if the materials do not fail the TCLP;
- ✓ Inspection of the interiors of homes on property to be excavated to identify possible additional sources of lead exposure and recommend appropriate actions to minimize exposure;
- ✓ Monitoring of groundwater at the industrial facility and implementation of a contingency plan, if needed, to remediate contaminated groundwater;
- ✓ Implementation of dust control measures during all remedial construction activities;
- ✓ Construction of a RCRA-compliant, multi-media cap over the expanded Taracorp pile and a clay liner under all newly-created portions of the expanded Taracorp pile and construction of storm water and erosion controls on and around the pile;
- ✓ Development of contingency plans to provide remedial action in the event that the concentration of contaminants in groundwater or air (lead or PM10 (particulate matter greater than 10 microns) exceed applicable standards or established action levels, or that waste materials or soils have become releasable to the air in the future;
- ✓ Development of contingency measures to provide for sampling and removal of any soils within the zone of contamination, defined by the soil lead sampling to be implemented above, with lead concentrations above 500 ppm which are presently capped by asphalt or other barriers but become exposed in the future due to land use changes or deterioration of the existing use; and
- ✓ Monitoring of nearby communities to determine if additional areas need remediation or lead exposures need mitigation.

Enforcement Activities and History

Following unsuccessful efforts to negotiate a settlement with the PRPs for remedy design and implementation, U.S. EPA, on November 27, 1990, issued a Unilateral Administrative Order (UAO), pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. The UAO directed certain PRPs to undertake the response actions identified in the ROD. The UAO was issued to NL Industries (former owner/operator) and the top 49 generators at the Site to conduct the remedial action for the Site. In issuing this UAO, U.S. EPA made a number of findings based on the Administrative Record, including a finding that the release or threat of release of hazardous substances from the facilities at the Site is or may be presenting an imminent and substantial endangerment to the public health or welfare or the environment.

The UAO required that U.S. EPA be notified if the PRPs intended to comply with the UAO. Since none of the recipients of the Order notified U.S. EPA of its intention to comply fully with

the Order, in 1991 U.S. EPA brought an action in federal court to compel certain PRPs to comply with the UAO, pay penalties for their failure to comply with the 1990 UAO, and pay response costs.

After these PRPs failed to comply with the UAO, U.S. EPA undertook the Remedial Design (RD) and the Remedial Action (RA) for the Site using Superfund money. The RD, which involved gaining access to and sampling approximately 3000 residential yards, was started in 1991 and finished in 1993. In 1993, U.S. EPA, with the U.S. Army Corps of Engineers (Corps), commenced a rapid response action in 1993 to clean up the most highly contaminated yards, parking lots, driveways, and alleys where crushed battery casing material from the Site was used as fill. In August 1994, U.S. EPA began implementation of the remedial action for the approximately 1,600 residential yards that were contaminated via smelter stack emissions. In 1994, the City of Granite City and the PRPs sought a court order halting U.S. EPA's cleanup, disagreeing with the 500 ppm cleanup level for residential areas. As a result of this action, U.S. EPA agreed to suspend certain cleanup activities and reopen the public comment period for the residential soil cleanup level to allow for U.S. EPA's evaluation of all information that had become available subsequent to the March 30, 1990 ROD. Accordingly, U.S. EPA released a Proposed Plan and reopened the public comment period for the residential soil lead cleanup level on October 14, 1994. U.S. EPA did reconsider new information submitted by the PRPs. On September 29, 1995, U.S. EPA issued the *DD/ESD*, as is discussed more fully above. U.S. EPA then resumed remedial activities.

In 1994, the defendants and the City of Granite City sought a temporary restraining order against U.S. EPA in an effort to halt or enjoin the cleanup. In 1996, the PRPs and the City of Granite City parties again tried to enjoin the U.S. EPA clean-up activities. In August 1996, the federal district court found that the PRPs did not demonstrate the harm that was alleged and that the court had no authority to halt U.S. EPA's remedial efforts. The generator defendants then approached U.S. EPA to negotiate a settlement. In July 1998, six of the generator defendants took over the RA and finished all of the cleanup activities at the Site. This work was performed under a Consent Decree (No. 91-CY -578-JLF). The only remaining enforcement issues are to clarify the costs incurred by the U.S. Army Corps of Engineers as required by the CD.

The CD between the United States and the six generators was entered on March 20, 2003. This CD required that the generators finish all remaining remedial work at the Site (which had already happened by the time the CD was entered); pay U.S. EPA \$8,970,000 in past costs; perform a \$2,000,000 Supplemental Environmental Project (SEP) for paint assessment and abatement in the Site area; and pay U.S. EPA a \$400,000 civil penalty.

A separate Consent Decree with NL Industries, Inc., which was entered on May 12, 2003, required NL Industries, Inc., to pay U.S. EPA the amount of \$29,780,000 in past costs and a \$1,000,000 civil penalty. NL Industries, Inc. has fully complied with this second CD.

Remedy Implementation

As mentioned above, the remedy implementation was begun by U.S. EPA. Using the assistance of the Corps, a rapid response action was commenced in 1993 to clean up the most highly contaminated yards, parking lots, driveways, and alleys where crushed battery casing material from the Site was used as fill. In August 1994, U.S. EPA began implementation of the remedial action for the approximately 1500 residential yards that were contaminated via smelter stack emissions. After several starts and stops due to legal matters that are discussed above, U.S. EPA finished a portion of the cleanup (approximately 740 residential yards) in 1998, and the six generators took over the remedial action and finished the residential yard cleanups (approximately 770 yards), the remaining fill area cleanups, capping of the Taracorp pile, and installing and sampling the expanded groundwater monitoring system by May 30, 2000. Due to the fact that wastes were left in place, via capping of the Taracorp pile, inspections to determine the integrity of the cap and groundwater and leachate monitoring were required.

Remedial Design /Remedial Action

Starting in 1991, U.S. EPA performed most of the RD for the Site and about half of the RA. In February 1993, the U.S. EPA entered into an interagency agreement with the Corps to design and implement the remedy. The Corps, in turn contracted with OHM Remediation Services Corporation to conduct the remedial work under a contract. The cleanup was separated into two distinct phases: 1) a rapid response - comparable to a removal action and 2) a longer-term remedial action managed by the Corps. For the rapid response action, the contractor sampled the property where battery casings were used as fill, and cleaned approximately 110 residential areas/alleys requiring immediate attention. For the remedial action, OHM cleaned up another 650 residential lots and alleys that were impacted from smelter stack emission fallout. In general, the contractor was directed to identify the extent of contamination at each property and to eliminate the exposure.

U.S. EPA completed the RD for the soil cleanup portion of the Site and began to remediate the contaminated residential soil, beginning with the areas of greatest contamination first. the highly lead-contaminated battery case material that was used as fill material (remote fill areas), and the areas closest to the former smelter.

In August 2000, U.S. EPA conducted a pre-final inspection at the Site. U.S. EPA documented that the following activities were completed in accordance with the ROD and ESDs:

- A total of 1505 residential yards containing lead-contaminated soil were excavated and restored. Of these, approximately 770 were completed by the PRPs;
- All excavated areas of the Site were backfilled with clean soil and revegetated;
- Home interiors were vacuumed with a HEPA vacuum if the homeowner agreed to this measure;
- Approximately 100 residential yards and alleys in Venice and Eagle Park Acres where battery chips were used as fill material were cleaned up between 1993 and 1999;
- An underground storage tank and drums were removed and stabilized;
- Soils that were transported off-site were tested to ensure that the landfill requirements were achieved;

- Excavation activities were performed so that, with only a few exceptions where access was not granted, all soils that remain on the residential properties are below the selected cleanup level of 500 ppm total lead. All soils that remain on the industrial properties are below the selected cleanup level of 1,000 ppm total lead. Any soils which failed TCLP testing for lead (i.e., below 5.0 mg/L) were treated prior to disposal;
- All excavated areas of the industrial facility were consolidated into the Taracorp pile and backfilled with clean soil;
- On-going groundwater sampling is required to demonstrate that the groundwater contamination does not migrate away from the main industrial portion of the Site;
- After quarterly groundwater sampling demonstrated that the groundwater contamination was not migrating, U.S. EPA agreed to a modification of the sampling frequency. Historic groundwater data have indicated that lead, zinc, and cadmium levels exceed applicable groundwater standards in wells immediately adjacent to the Taracorp pile; however, this contamination has not migrated more than approximately 200 feet. Currently, groundwater sampling only occurs during the five-year reviews.

Sampling was planned during this fourth five-year review to occur early in the year. However, due to the weather, the sampling has been postponed until April. It is expected that the results will be similar to the previous evaluation in that the groundwater and that the contamination will have not migrated. U.S. EPA will continue to require groundwater sampling during the next five-year review.

Over the years, groundwater monitoring wells were added to the groundwater monitoring network for the Site. Several wells were abandoned and replaced.

Temporary site security fencing, and upon completion of capping, permanent fencing was put in place at the Site.

The readily accessible portions of the Slough Road area in Venice, Illinois, contaminated with battery chips, were paved.

Appendix B

Figures

Figure 1 -Well Location and Groundwater

Figure 2 - Site Location Map

Figure 3 –NL/Taracorp Soil Remediation Cleanup Zones

Figure 4 - NL/Taracorp Site Cleanup Zones

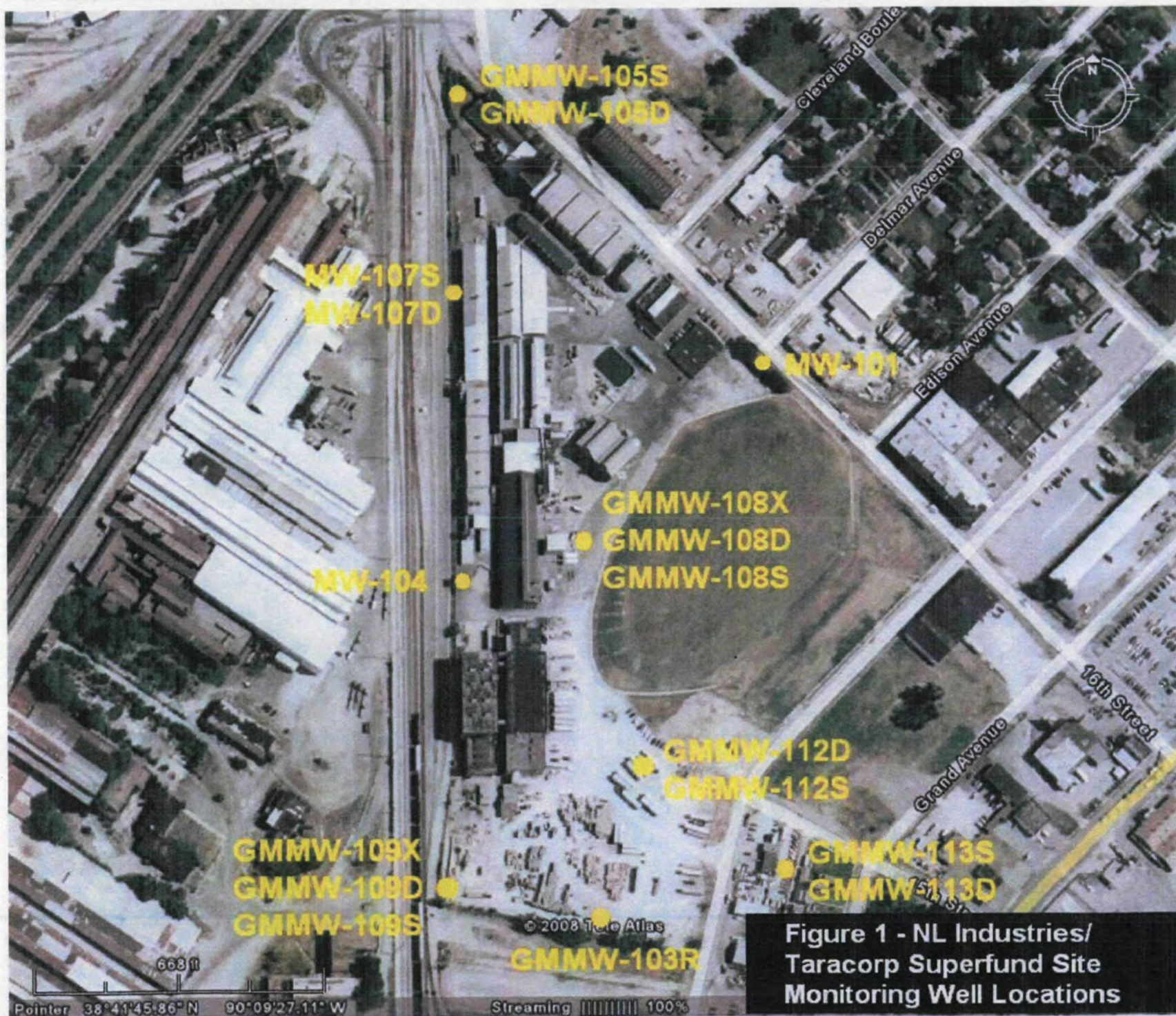
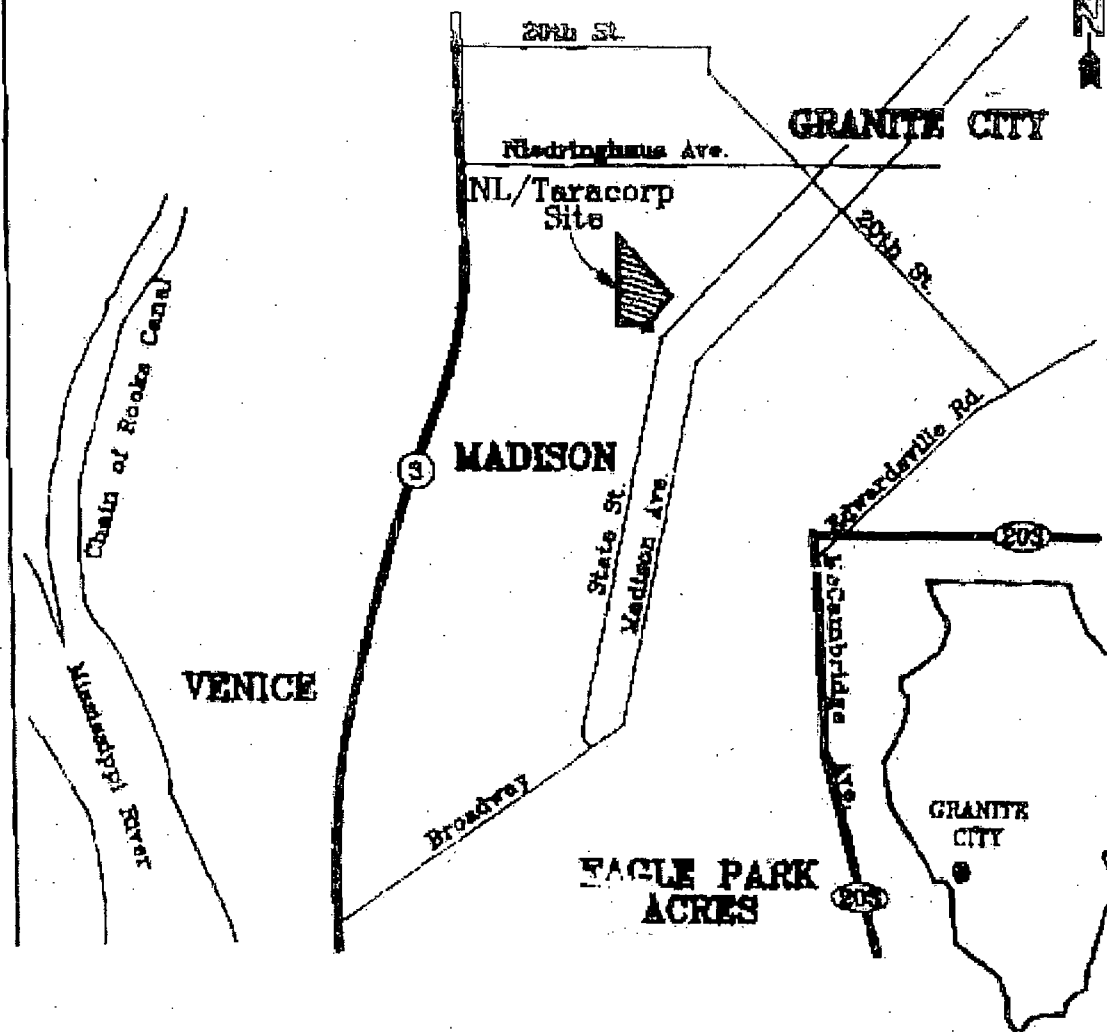


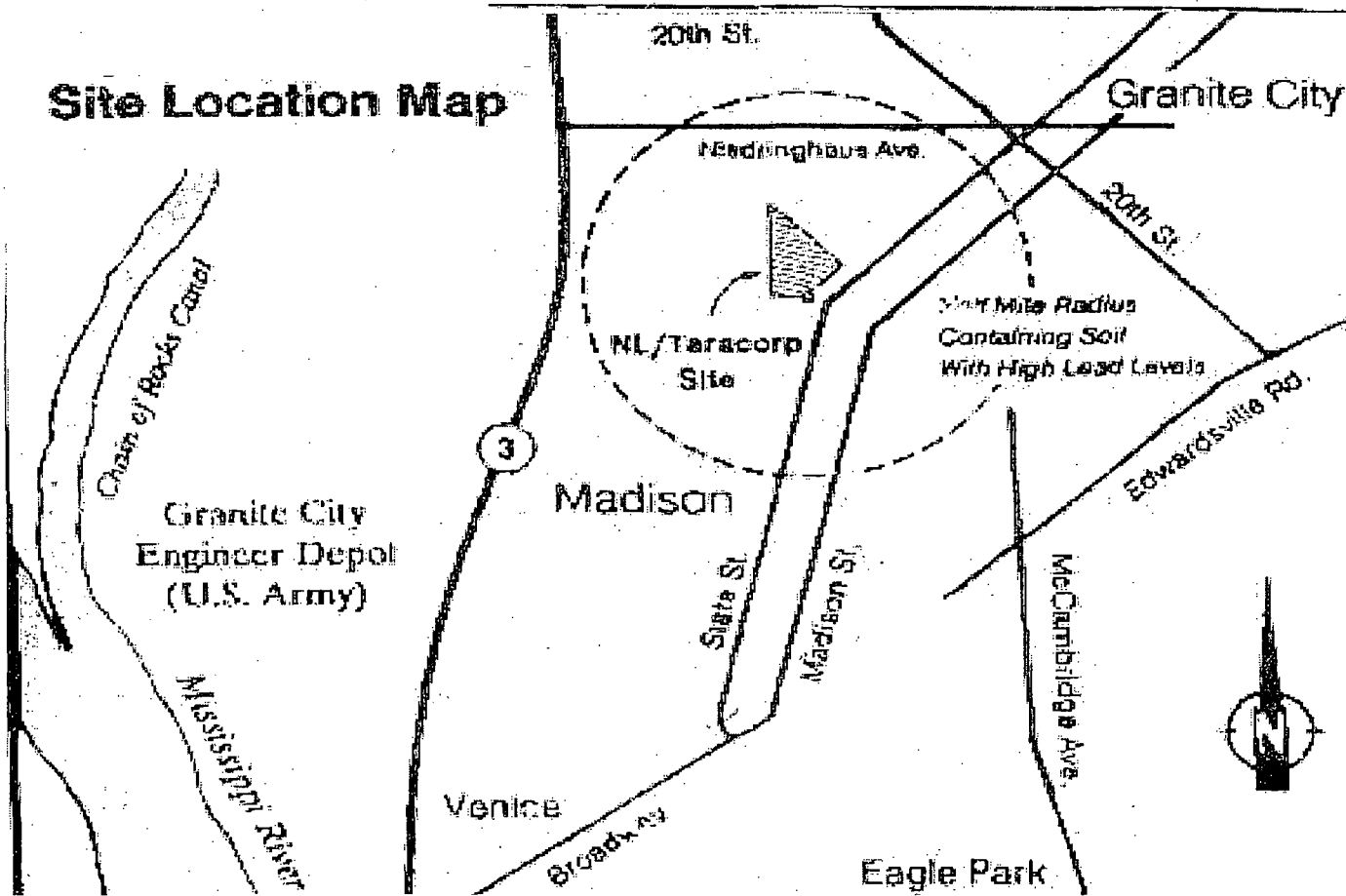
Figure 1 - NL Industries/
Taracorp Superfund Site
Monitoring Well Locations

FIGURE 2

Site Location Map



Site Location Map



N.L. Tara Corp Super Fund Site Clean Up Zones

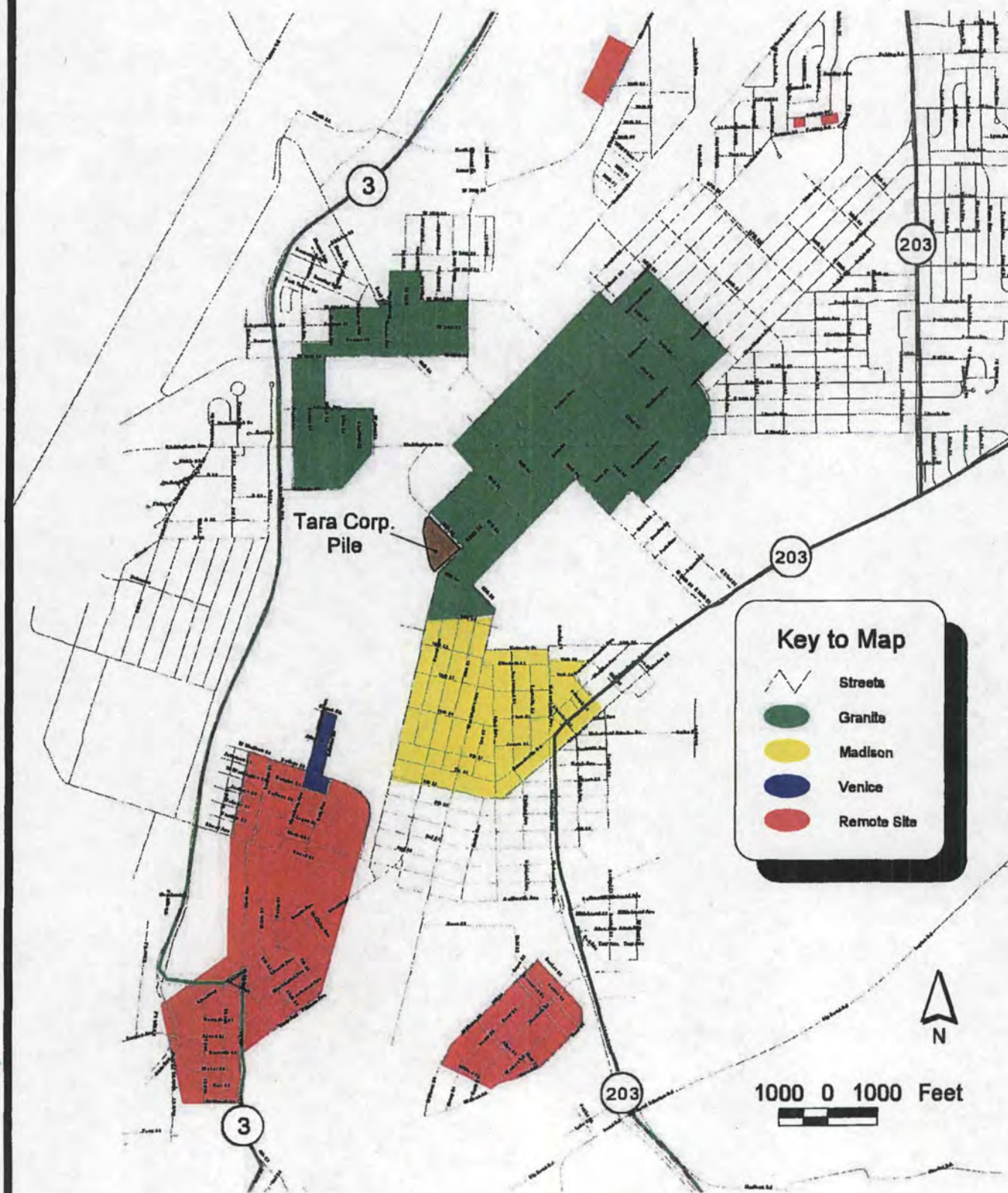


FIGURE 3



The map displays the following streets and landmarks:

- West Granite City, Illinois:**
 - Streets: Cayuga, Denver, W. 20th, W. 22nd, W. 23rd, W 24th, Adams, Benton, Cleveland, Delmar, Edison, State, Grand, Madison, Iowa, Lee, Monroe.
 - Landmarks: St. Louis, Walnut, Niedringhaus, Chicago, Cedar, Spruce, Maple, Olive, Chestnut.
- Granite City, Illinois:**
 - Streets: 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, Adams, Benton, Cleveland, Delmar, Edison, State, Grand, Madison, Iowa, Lee, Monroe.
 - Landmarks: Kennedy, McCambridge, Rhodes, 203, 205.
- Venice, Illinois:**
 - Streets: W. Madison College, Douglas, Allen, Rogen, Salvator, Meredith, Selb.
- Madison, Illinois:**
 - Streets: 4th, 5th, 6th, 7th, 8th, 10th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, Adams, Benton, Cleveland, Delmar, Edison, State, Grand, Madison, Iowa, Lee, Monroe.

A red oval is located near the intersection of 15th and 16th, highlighting a specific area of interest.

LEGEND



Area of Cleanup



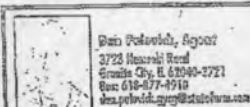
0 1000 2000

Approximate Scale in Feet

Appendix C

Notification to Public of Five-Year Review Start

THE BEST IN
COMMUNITY SPORTS
COVERAGE



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Granite City

Local Newspaper - Granite City, Illinois

VOLUME 1, NUMBER 24

WEDNESDAY, OCTOBER 30, 2013

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EPA Begins Review Of NL/Taracorp Superfund Site Granite City, Illinois

U.S. Environmental Protection Agency is conducting a five-year review of the NL/Taracorp Superfund site located at 16th St. and Cleveland Ave in Granite City, IL and the surrounding area. The Superfund law requires regular checkups of sites that have been cleaned up—with waste managed on-site—to make sure the cleanup continues to protect people and the environment. This is the third five-year review of this site.

The EPA's cleanup of lead contamination at the Site consisted of placing a soil cap over the large slag pile at the Site, and remediating residential soil, alleys, and driveways that were contaminated by airborne lead and/or hard rubber battery casing material, and groundwater monitoring. Institutional controls such as property deed restrictions and ordinances are also being pursued in the areas where contamination remains in place. This includes the capped pile, alleys and roadways in Venice, Madison and Eagle Park Acres and on Slough Road where battery casings remain. Other necessary actions include soil sampling of residential yards that are adjacent to yards where the residents refused access for the cleanup. U.S. EPA continues to pursue access from property owners to cleanup properties where contamination still remains and those who previously refused access for sampling or remediation.

More information is available at the Granite City Hall, City Clerk's Office, 2000 Edison Ave., and at <http://www.epa.gov/region5/cleanup/nltaracorp/index.html>. The review should be completed by March 2014.

The five-year review is an opportunity for you to tell the EPA about site conditions and any concerns you have. Contact:

Sheri L. Bianchin
Remedial Project Manager
Superfund Division (SR-6J)
EPA Region 5
312-886-4745
bianchin.sheri@epa.gov

Janet Pope
Community Involvement Coordinator
Superfund Division (SI-7J)
EPA Region 5
312-353-0628
pope.janet@epa.gov

You may also call the EPA toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.

Appendix D

Documents Reviewed

Documents Reviewed

1. Record of Decision for the NL Industries/Taracorp Site in Granite City, Illinois-March 30, 1990 (U.S. EPA)
2. ESD signed on May 7, 1993 (U.S. EPA)
3. ESD signed on March 31, 1993 (U.S. EPA).
4. ESD signed on January 27, 1994 (U.S. EPA)
5. Decision Document/Explanation of Significant Differences- September 29, 1995 (U.S. EPA)
6. Explanation of Significant Differences- September 19, 2000 (U.S. EPA)
7. First Five-Year Review Report- March 31, 1999 (U.S. EPA)
8. Second Five-Year Review Report- March 30, 2004 (U.S. EPA)
9. Third Five-Year Review Report- March 30, 2009 (U.S. EPA)
10. Comprehensive Five-Year Review Guidance- June 2001 (U.S. EPA) and Supplements to the Five Year Review Guidance (U.S. EPA)

Appendix E

FYR Inspection Roster/ Photographs

NL / Taracorp Site Inspection Five-Year Renewal

11/6/13

Name	Agency/Affiliation	Phone / Email
Doyle Wilson	IEPA	217-782-7592 doyle-wilson@illinois.gov
Thomas Miller	IEPA	618/346-554 tom.miller@illinois.gov
Kate Kutubky	SFGB for ALU	314- 863 7733 kutubky.e@spencerfane.com
Ben Grance	Greiner Saggio & Harlan LLP (Johnson Controls Inc.)	608-852-4554 ben_grance@jshllp.com 414-755-8140
JEFF LEED	PROJECT COORDINATOR NL INDUSTRIES / TARACORP SUPERFUND SITE GROUP	(610) 670-7310 jleed@leedenviro.com mental.com
SHERI BIANCHINI	Remedial Project Manager USEPA	(312) 886-4745 bianchini.sheri@epa.gov

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

**Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
Reading, PA 19609
Telephone: (610) 670-7310
Facsimile: (610) 670-7311**

November 8, 2013

By Electronic Mail and First Class Mail

Ms. Sheri L. Bianchin
Remedial Project Manager
Institutional Controls Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604

**Re: NL Industries/Taracorp Superfund Site; Granite City, Illinois
Second 2013 Semi-Annual Operation and Maintenance Inspection (November 2013)**

Dear Ms. Bianchin:

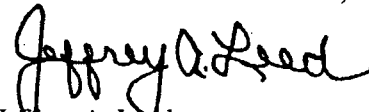
In response to your request, enclosed is a CD that contains 145 photographs taken on November 4, 2013 during the second 2013 operation and maintenance inspection at the NL Industries/Taracorp Superfund Site. The photographs, which are included on the CD in the same order as they are provided and labeled in Appendices 1-6 of the November 2013 operation and maintenance inspection report (which I am also mailing to you today), are listed as follows:

1. Slough Road – 19 photographs (S1825 to S1843)
2. Eagle Park Acres (Watson Alley) – 9 photographs (S1844 to S1852)
3. Venice Alleys – 23 photographs (S1853 to S1875)
4. 1555 State Street and Taracorp pile – 71 photographs (S1876 to S1947)
5. Eagle Park Acres (Remote Fill Properties) – 7 photographs (S1948 to S1954)
6. Schaeffer Road – 7 photographs (S1955 to S1961)
7. Sand Road – 9 photographs (S1962 to S1970)

Please let me know if you have questions. Thank you.

Very truly yours,

LEED ENVIRONMENTAL, INC.



Jeffrey A. Leed
Project Coordinator

attachment

cc: Mr. Doyle Wilson – Illinois EPA (without attachment, by electronic mail)
Technical Committee, NL Industries/Taracorp Superfund Site Group
(without attachment, by electronic mail)

NL Industries/Taracorp Superfund Site Operation and Maintenance
20131108_SBianchin Transmittal

Appendix F

Recent O&M Report, Quarterly SEP
Progress Report and
Quarterly Consent Decree Progress Report

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

**Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
Reading, PA 19609
Telephone: (610) 670-7310
Facsimile: (610) 670-7311**

January 3, 2014

By Electronic Mail and First Class Mail

Ms. Sheri L. Bianchin
Remedial Project Manager
Institutional Controls Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604

**Re: NL Industries/Taracorp Superfund Site; Granite City, Illinois
Supplemental Environmental Project – Quarterly Progress Report 4
October – December 2013**

Dear Ms. Bianchin:

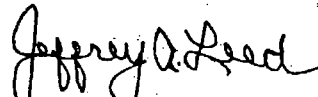
The NL Industries/Taracorp Superfund Site Group (Group) received Quarterly Progress Report 4 from the Madison County Community Development (MCCD) for the Supplemental Environmental Project (SEP) for the NL Industries/Taracorp Superfund Site (site). A copy of the quarterly progress report for the October – December 2013 period and for the project to date is attached for your review.

As indicated in the report, MCCD received no applicants for participation in the SEP during the October-December 2013 period. For the SEP to date, mitigation and clearance testing have been performed and determined by MCCD to be complete at 115 properties located within the boundaries of the site.

Please advise if additional information or clarification is needed at this time.

Very truly yours,

LEED ENVIRONMENTAL, INC.



Jeffrey A. Leed
Project Coordinator

attachments

cc: Ms. Peggy Dugger – Madison County Community Development
(with attachments, by first class mail)
Mr. Doyle Wilson – Illinois EPA (with attachments, by first class mail)
Technical Committee, NL Industries/Taracorp Site Group (with attachments, by electronic mail)

**MONTHLY REPORT
SEP / EPA**

GRANTEE

Madison County Community Development

MONTH REPORTING

October – December 2013

Existing Grant	Project To Date	December 2013		Total
		SEP / EPA	Other	
Applications Taken	144	0	0	144
Risk Assessment Out	118	0	0	118
Hazard Control Contracts Signed	115	0	0	115
Clearance Test Complete	115	0	0	115
Lead Safe Assessments	0	0	0	0
	CLOSED	CLOSED	CLOSED	CLOSED
Closed – Over Income	1	0	0	1
Closed – Lack of Information	7	0	0	7
Closed – Unpaid Sewer/Taxes/ No Insurance/Lien or Judgment	10	0	0	10
Closed per Clients Request or Ignored Letters and Phone Messages	3	0	0	3
Closed Other	6	0	0	6
Total Closed	27	0	0	27

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

**Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
Reading, PA 19609
Telephone: (610) 670-7310
Facsimile: (610) 670-7311**

November 8, 2013

By Electronic Mail and First Class Mail

Ms. Sheri L. Bianchin
Remedial Project Manager
Institutional Controls Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604

**Re: NL Industries/Taracorp Superfund Site; Granite City, Illinois
Second 2013 Semi-Annual Operation and Maintenance Inspection (November 2013)**

Dear Ms. Bianchin:

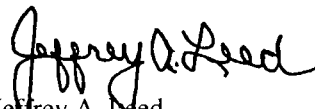
Enclosed for your review are copies of the log sheets, notes, and reproductions of photographs from the second 2013 semi-annual operation and maintenance inspection performed on November 4, 2013 at the NL Industries/Taracorp Superfund Site in Granite City, Illinois. The results of the inspection are summarized on the log sheets which are attached.

In preparation for the inclusion of several remote fill properties previously remediated by the U.S. Environmental Protection Agency into the institutional controls program, the inspection included an examination of conditions at Schaeffer Road, Sand Road, and three properties in Eagle Park Acres (non-responsive [REDACTED]).

Please contact this office if additional information or clarification is needed at this time.

Very truly yours,

LEED ENVIRONMENTAL, INC.


Jeffrey A. Leed
Project Coordinator

attachments

cc: Mr. Doyle Wilson – Illinois Environmental Protection Agency
(w/attachments, by electronic mail and first class mail)
Technical Committee, NL Industries/Taracorp Superfund Site Group
(w/attachments, by electronic mail)

**NL Industries/Taracorp Superfund Site
Inspection Log - Operation and Maintenance**

Inspector's Name/Company: Jeff Leed, Leed Environmental, Inc.

Inspection Date: 11/4/2013

Site Structure	Inspected (yes/no)	Inspection Observations	Maintenance Work Performed or Required
Security Fence:			
Gates/locks secure and operative	Yes	Gate near 16th and State Streets was locked at the time of the inspection. The NL Industries/Taracorp Superfund Site Group's combination lock and the combination lock that Munie Greencare Professionals (Munie) installed on the front gate in August 2007 were in operational condition. No evidence of rust/corrosion was observed.	
Evidence of rust, cuts, deterioration	Yes	The fence was secure; no evidence of excessive rust, cuts, or significant deterioration.	
Evidence of unauthorized entry	Yes	No evidence of unauthorized entry.	
Burrowing or tunneling under fence	Yes	No evidence of burrowing or tunneling under fence.	
Damaged barbed wire	Yes	No evidence of damaged barbed wire.	
Comments		A small section of fence (Attachment 4, photographs 20 and 21) on the western side of the Taracorp pile was observed to be slightly bent, and a small section of barbed wire at the top of the fence was broken.	Although a small section of fence is slightly bent, the fence is still intact and acceptable for restricting access. Continue to monitor.
Access Road:			
Evidence of settlement or deterioration	Yes	No evidence of settlement, deterioration, or other problems to access roads.	
Comments			
Landfill Cover - Vegetation:			
Establishment of grass from initial seeding	Yes	Grass/vegetation is well established over the entire Taracorp pile cap and main industrial site.	Munie cut the vegetation at the 1555 State Street property and on the Taracorp pile during the week of 10/14/2013.
Adequate growth of vegetation	Yes	Vegetation is abundant and thick across the entire site.	
Evidence of stress	Yes	No evidence of stress.	
Presence of trees/shrubs	Yes	No small bushes/trees were observed on the Taracorp pile cap.	
Need for mowing/maintenance	Yes	No current need for maintenance on the Taracorp pile cap.	
Comments			
Landfill Cover - Erosion			
Evidence of erosion	Yes	No significant erosion was observed. During the site inspection performed in November 2008 as part of the five-year review, potential erosion areas (vegetated ridges) were observed near the base of the slope on the southeastern side of the Taracorp pile cap. In June 2009, Munie rolled the surface to eliminate the ridges without disturbing the surface vegetation. Abundant vegetation was observed in this area during the November 2013 inspection.	Continue to check this area during subsequent inspections.
Indicate areal extent and location	---		
Comments			

NL Industries/Taracorp Superfund Site
Inspection Log - Operation and Maintenance

Inspector's Name/Company: Jeff Leed, Leed Environmental, Inc.

Inspection Date: 11/4/2013

Site Structure	Inspected (yes/no)	Inspection Observations	Maintenance Work Performed or Required
Landfill Cover – Settlement			
Evidence of settlement	Yes	No settlement evident.	
Indicate areal extent and location	---		
Comments			
Landfill Cover – Cracks			
Evidence of cracks	Yes	No cracks evident.	
Indicate areal extent and location	---		
Comments			
Landfill Cover – Bulges			
Evidence of bulges	Yes	No bulges evident.	
Indicate areal extent and location	---		
Comments			
Landfill Cover – Ponding			
Evidence of ponding	Yes	No ponding evident.	
Indicate areal extent and location	---		
Comments			
Landfill Cover – Seeps			
Evidence of seepage (leachate)	Yes	No seepage evident.	
Indicate areal extent and location	---		
Comments			
Landfill Cover – Slope Stability			
Evidence of sliding	Yes	No sliding evident.	
Indicate areal extent and location	---		
Comments			
Leachate Management System			
Riser pipe and locks	Yes	Riser pipe clean and in good condition. The lid on the riser pipe was locked.	
Leachate levels in sump	No	A very small volume of leachate was removed from the sump by ARCADIS during the January 2009 inspection performed as part of the five-year review.	
Necessary sampling activities	No		
Necessary leachate disposal	No		
Comments			

**NL Industries/Taracorp Superfund Site
Inspection Log - Operation and Maintenance**

Inspector's Name/Company: Jeff Leed, Leed Environmental, Inc.

Inspection Date: 11/4/2013

Site Structure	Inspected (yes/no)	Inspection Observations	Maintenance Work Performed or Required
Concrete Drainage Channel			
Evidence of cracks or obstructions	Yes	No visible cracks or obstructions.	
Areas of erosion	Yes	No erosion observed.	
Comments		During the June 2013 inspection, one intact spent lead-acid battery was observed on the ground surface on the State Street Warehouse property near the concrete drainage channel along the south side of the Taracorp pile. The battery was observed to be located near a stack of wooden pallets and in proximity to several forklift vehicles, probably associated with the operation of S&S Pallet Company on the property.	This matter was discussed with Mr. Scot Oney immediately following the June 2013 inspection. Mr. Oney agreed to remove and recycle the spent battery. During the November 2013 inspection, the intact battery was not observed.
Asphalt Covers - Integrity			
Evidence of broken asphalt or fissures	Yes	Some minor asphalt cracking was observed along the sides of several paved alleys in Venice. No battery case fragments were observed in those areas. Evidence of paving/patching of the alleys by Venice Township has been observed during previous inspections.	Continue to monitor.
Indicate areal extent and location	---		
Comments			

Other Notes/Observations:

1. At Slough Road (as shown on Figure 1 and the photographs in Attachment 1), the property owner (Beelman Truck Company) has placed about two feet of soil to cover most of the paved roadway (Slough Road) and several areas where small quantities of battery case chips had been visible on the ground surface. This area is now overgrown with vegetation. The southern part of Slough Road and a small area where battery case chips were observed has not yet been covered with soil. A small pond, probably for collection of surface water runoff, is now located to the west of the Robin's Nest Lounge (the pond was dry during the November 2013 inspection).
2. Watson Alley in Eagle Park Acres (as shown on Figure 2 and the photographs in Attachment 2) was inspected and noted to be in good condition. The soil piles (Figure 2 and Attachment 2 photographs 6-9) that originated from the previous Army Corps of Engineers' sanitary sewer installation project appear to have been removed from the properties, and the properties have been restored and re-vegetated.
3. Several alleys in Venice that were paved during remedial activities were inspected and noted to be in generally good condition with some minor cracking observed in some areas. No battery case chips were observed. The alleys are shown on Figure 3 and are identified on the photographs in Attachment 3.
4. Photographs showing the Taracorp pile cap and main industrial site are provided in Attachment 4. Vegetation is thick and abundant on the cap; no significant problems related to the perimeter security fence and locked gate were observed.
5. State Street (along the 1555 State Street property) was recently paved by the City of Granite City. The concrete sidewalk along State Street at the main industrial site is continuing to deteriorate. Some battery case chips are visible in the area below the deteriorated sidewalk.
6. Remote fill properties previously remediated by EPA (and where lead-impacted soil and/or battery case chips may remain in place) were observed during the inspection. As shown in Appendix 5, Appendix 6, and Appendix 7, the remote fill properties include three properties in Eagle Park Acres (200 Harrison Street, 206 Terry Street, and 200 Allen Street), Schaeffer Road, and Sand Road.

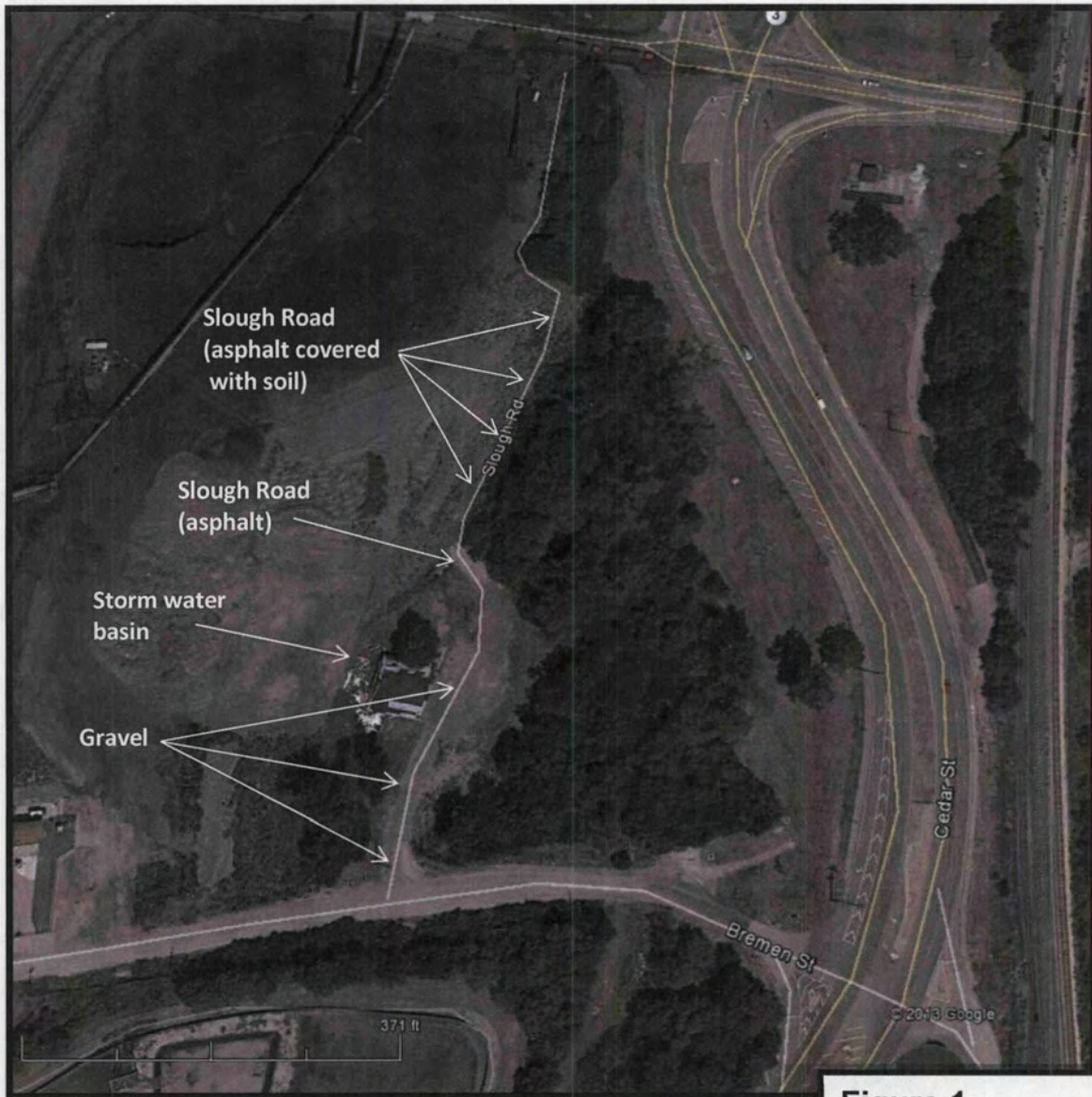
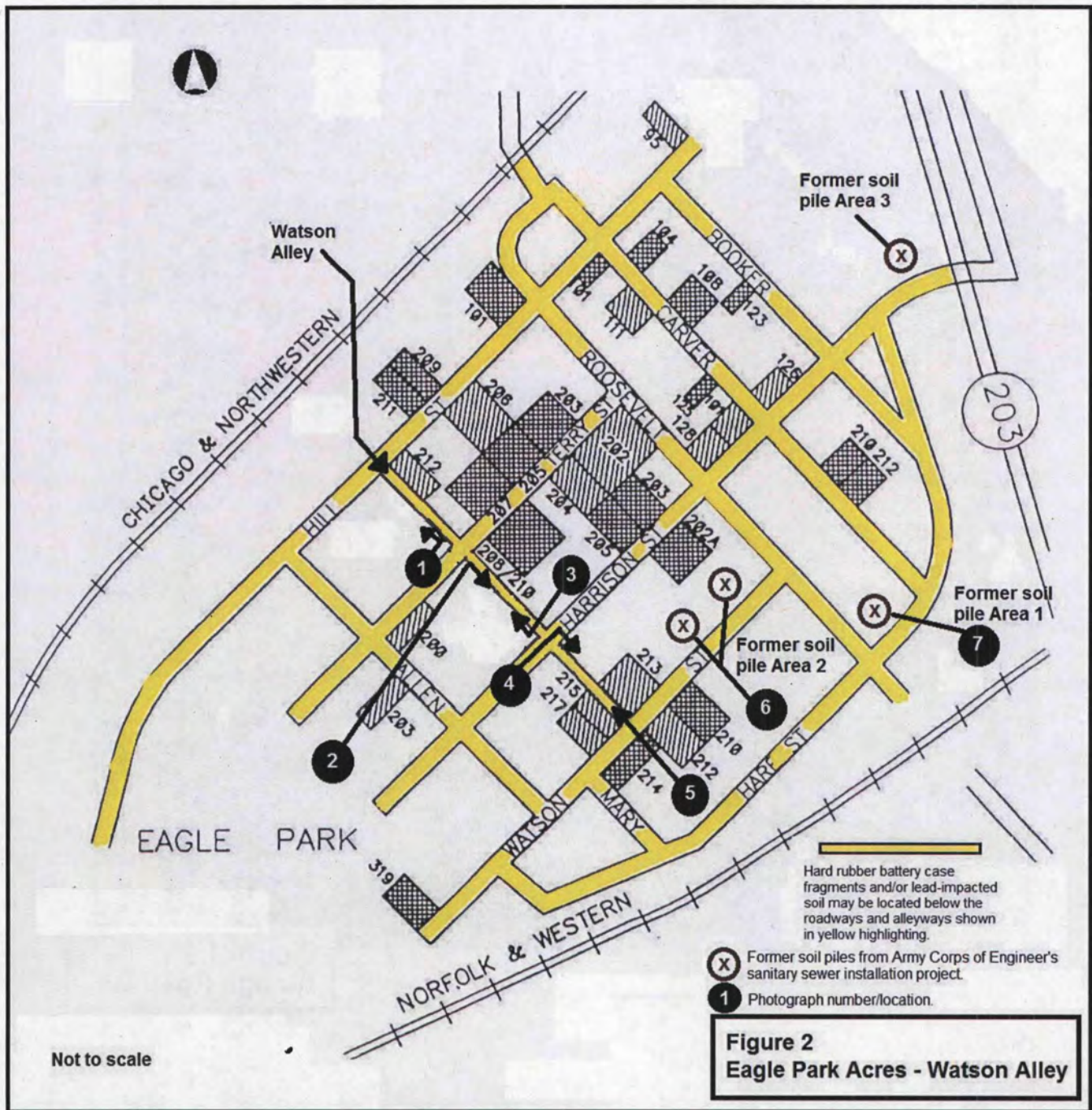


Figure 1
Slough Road



MADISON
POP. 5,301

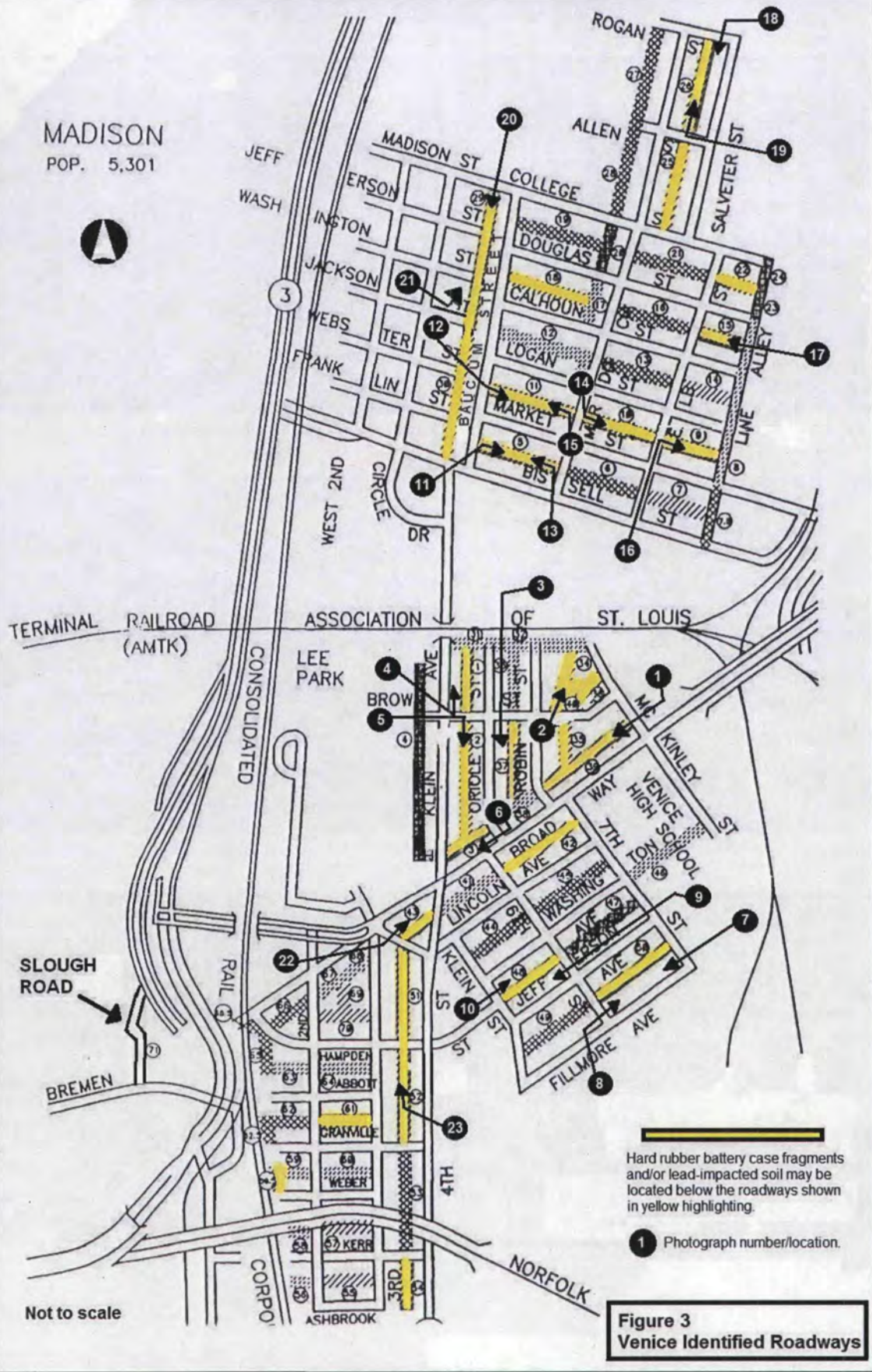


Figure 3
Venice Identified Roadways

Attachment 1
Slough Road Photographs (November 4, 2013)



Photograph 1: Robin's Nest Lounge at Slough Road, east side of building.



Photograph 2: Gravel entranceway, Robin's Nest Lounge at Slough Road.



Photograph 3: Cleared area behind Robin's Nest Lounge.



Photograph 4: Slough Road.



Photograph 5: Slough Road.



Photograph 6: Slough Road, Robin's Nest Lounge in background.

Attachment 1
Slough Road Photographs (November 4, 2013)



Photograph 7: Debris (roof shingles, wood, concrete) at Slough Road.



Photograph 8: Debris (roof shingles) at Slough Road.



Photograph 9: Debris (PVC pipe, plastic, etc.) at Slough Road.



Photograph 10: Debris (plastic containers, etc.) at Slough Road.



Photograph 11: Former paved area at Slough Road (now covered with about two feet of fill from Beelman operations and heavily vegetated).



Photograph 12: Slough Road.

Attachment 1
Slough Road Photographs (November 4, 2013)



Photograph 13: Cleared area behind Robin's Nest Lounge.



Photograph 14: Pond (west of Robin's Nest Lounge); no surface water in impoundment.



Photograph 15: Robin's Nest Lounge at Slough Road; west side of building.



Photograph 16: Robin's Nest Lounge at Slough Road; north side of building.



Photograph 17: Gravel area (scattered battery chips) adjacent to Slough Road.



Photograph 18: Battery chips in gravel area.

Attachment 1
Slough Road Photographs (November 4, 2013)



Photograph 19: Gravel area (scattered battery chips) adjacent to Slough Road.

Attachment 2
Eagle Park Acres – Watson Alley Photographs (November 4, 2013)



Photograph 1: Watson Alley (gravel area).



Photograph 2: Watson Alley (gravel area).



Photograph 3: Watson Alley (gravel area).



Photograph 4: Watson Alley (paved area), view from Harrison Street.



Photograph 5: Watson Alley (paved area), view from Watson Street.



Photograph 6: Eagle Park Acres – former soil pile area 2 along Watson Street (soil piles from ACOE sanitary sewer installation project have been removed and property has been revegetated).

Attachment 2
Eagle Park Acres – Watson Alley Photographs (November 4, 2013)



Photograph 7: Eagle Park Acres – former soil pile area 2 along Watson Street near Roosevelt Street (soil piles from ACOE sanitary sewer project have been removed and the property has been revegetated).



Photograph 8: Eagle Park Acres – former soil pile area 2 along Watson Street near Roosevelt Street (soil piles from ACOE sanitary sewer project have been removed and the property has been revegetated).



Photograph 9: Eagle Park Acres – former soil pile area 1 along Hare Street (soil piles from ACOE sanitary sewer project have been removed and the property has been revegetated).

Attachment 3
Venice Alley Photographs (November 4, 2013)



Photograph 1: Alley at McKinley Street near Broadway.



Photograph 2: Alley at McKinley Street and Brown Street (view north).



Photograph 3: Alley between Robin Street and Oriole Street (view south).



Photograph 4: Alley between Oriole Street and Klein Avenue (view north).



Photograph 5: Alley (gravel) between Oriole Street and Klein Avenue (view south).



Photograph 6: Alley between Broadway and Oriole Street (view southwest).

Attachment 3
Venice Alley Photographs (November 4, 2013)



Photograph 7: Alley between Fillmore Avenue and Jefferson Street (view southwest from 17th Street).



Photograph 8: Alley between Jefferson Street and Fillmore Street (view northeast from 6th Street).



Photograph 9: Alley between Jefferson Street and Washington Street (view southwest from 6th Street).



Photograph 10: Alley between Jefferson Street and Washington Street (view northeast from Klein Street).



Photograph 11: Alley between Bissell Street and Market Street (view east from Baucum Street).



Photograph 12: Alley between Market Street and Logan Street (view east from Baucum Street).

Attachment 3
Venice Alley Photographs (November 4, 2013)



Photograph 13: Alley between Bissell Street and Market Street (view west from Meredocia Street).



Photograph 14: Alley between Market Street and Logan Street (view east from Meredocia Street).



Photograph 15: Alley between Market Street and Logan Street (view west from Meredocia Street).



Photograph 16: Alley between Market Street and Logan Street (view east from Selb Street).



Photograph 17: Alley between Calhoun Street and Douglas Street (view west from Line Alley). Several holes have been filled with asphalt since June 2012 inspection.



Photograph 18: Alley between Salveter Street and Meredocia Street (view south from Rogan Street).

Attachment 3
Venice Alley Photographs (November 4, 2013)



Photograph 19: Alley between Allen Street and Rogan Street (view north from Allen Street).



Photograph 20: Alley between Baucum Street and West 3rd Street (view south from Madison Street and College Street).



Photograph 21: Alley on Jackson Street (between 3rd Street and Baucum Street).



Photograph 22: Alley between 4th Street, Broadway, and Lincoln Avenue.



Photograph 23: Alley between 3rd Street and 4th Street (view north from Abbott Street).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 1: Vegetation inside fence (view southwest along State Street).



Photograph 2: Concrete drainage swale, south side of Taracorp pile (view northeast).



Photograph 3: End of concrete drainage swale, south side of Taracorp pile.



Photograph 4: Concrete drainage swale, south side of Taracorp pile (view northeast).



Photograph 5: Concrete drainage swale, east side of Taracorp pile (view northeast).



Photograph 6: Concrete drainage swale, east side of Taracorp pile (view southeast).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 7 and Photograph 8: Concrete drainage swale, fence, and vegetation, northeast side of Taracorp pile along 16th Street (view northwest).



Photograph 9: Concrete drainage swale and vegetation, northwest side of Taracorp pile (view southwest).



Photograph 10: Concrete drainage swale, northwestern side of Taracorp pile (view northeast).



Photograph 11 and Photograph 12: Concrete drainage swale, fence, and vegetation along northwestern side of Taracorp pile (view southwest).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 13: Concrete drainage swale, vegetation along northwestern side of Taracorp pile (view north/northeast).



Photograph 14: Fence, gate along northwestern side of Taracorp pile (view southwest).



Photograph 15: Vegetation near base of west side of Taracorp pile (view northeast).



Photograph 16: Vegetation near base of northwest side of Taracorp pile (view northwest).



Photograph 17: Vegetation near base of western side of Taracorp pile (view north).



Photograph 18: Concrete drainage swale and vegetation near base of western side of Taracorp pile (view south).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 19: Vegetation along western side of Taracorp pile cap (view north).



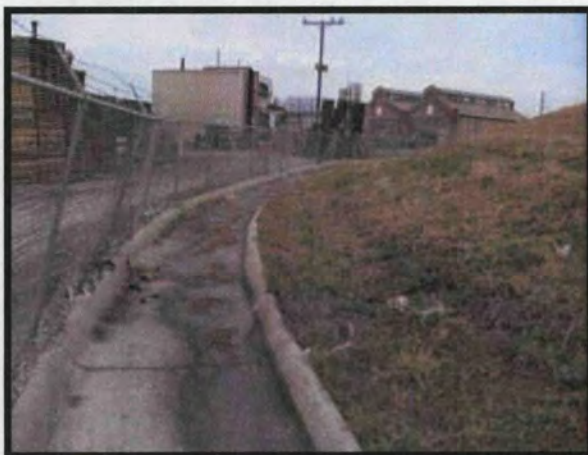
Photograph 20: Concrete drainage swale, bent fence posts along western side of Taracorp pile cap (view southwest).



Photograph 21: Bent fence posts along western side of Taracorp pile cap.



Photograph 22: Vegetation/concrete drainage swale, southwestern side of Taracorp pile cap (view southeast).



Photograph 23: Fence/concrete drainage swale (southwestern side of Taracorp pile cap).



Photograph 24: Concrete drainage swale/fence along southwestern slope of Taracorp pile cap (view southeast).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 25: Vegetation/concrete drainage swale along southwestern slope of Taracorp cap pile (view west).



Photograph 26: Vegetation/concrete drainage swale along southwestern slope of Taracorp cap pile (view west).



Photograph 27: Concrete drainage swale along southern slope of Taracorp pile.



Photograph 28: Concrete drainage swale along southern slope of Taracorp pile.



Photograph 29: Concrete drainage swale along southern slope of Taracorp pile.



Photograph 30: Concrete drainage swale along southern side of Taracorp pile.

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 31: Vegetation along southeast side of Taracorp pile cap (view northeast).



Photograph 32: Storm water outlet.



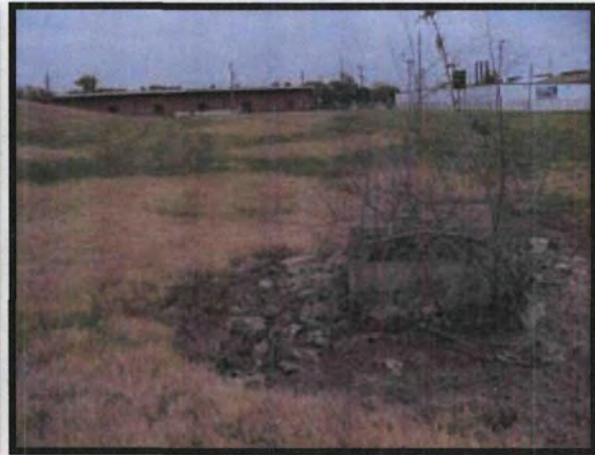
Photograph 33: Storm water outlet.



Photograph 34: Storm water outlet/vegetation.



Photograph 35: Storm sewer manhole near fence.



Photograph 36: Vegetation near storm water outlet.

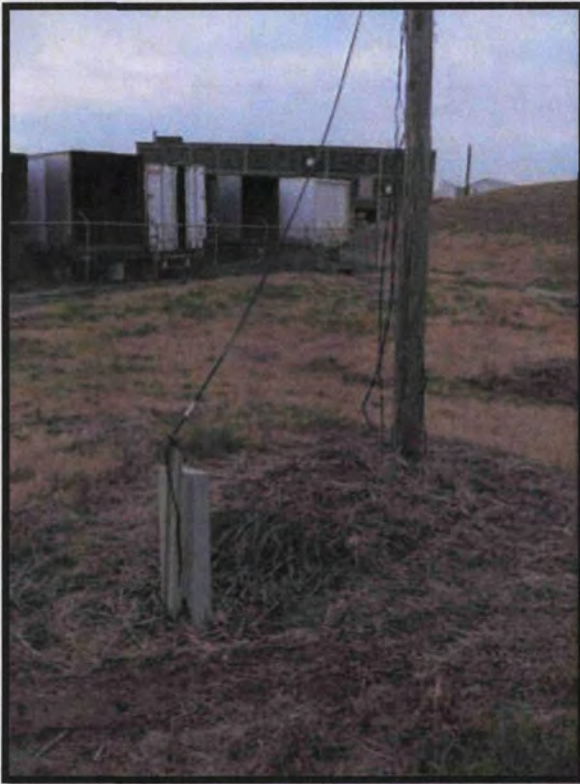
Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 37: Vegetation and fence near former Rich Oil facility (view toward State Street).



Photograph 38: Electrical utilities at utility pole near State Street.



Photograph 39: Electrical utilities at utility pole near State Street.



Photograph 40: Vegetation, southern side of Taracorp pile cap.



Photograph 41: Vegetation, eastern side of Taracorp pile cap.

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 42: Leachate riser pipe.



Photograph 43: Locked lid on leachate riser pipe (locked lid installed fall 2007).



Photograph 44: Former Rich Oil facility (view south from southern side of Taracorp pile cap).



Photograph 45: Vegetation on central top portion of Taracorp pile cap.



Photograph 46: Vegetation on western side of Taracorp pile cap.



Photograph 47: Vegetation on slope on western side of Taracorp pile cap.

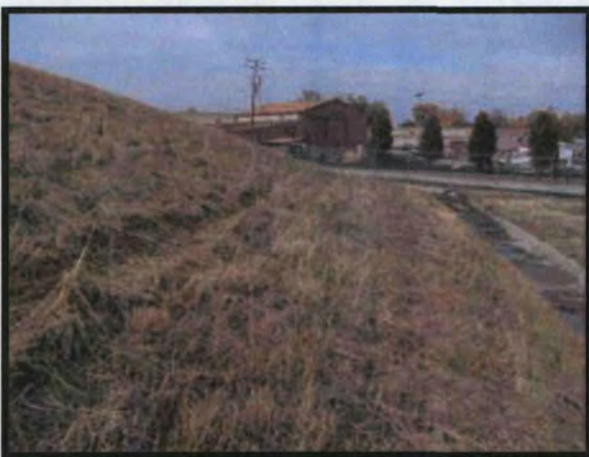
Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 48: Vegetation on northern slope of Taracorp pile cap.



Photograph 49: Area of former BV&G Trucking buildings (view east from northeastern side of Taracorp pile cap).



Photograph 50: Vegetation on northeastern side of Taracorp pile cap.



Photograph 51: Vegetation near fence along railroad tracks.



Photograph 52: Older and newer fence (near former BV&G Trucking buildings) along railroad tracks (view east).



Photograph 53: Older and newer fence (near former BV&G trucking buildings) along railroad tracks (view west).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 54: Fence, sidewalk, and vegetation along State Street.



Photograph 55: Fence, sidewalk, and vegetation along State Street.



Photograph 56: Fence, sidewalk, and vegetation along State Street.



Photograph 57: Fence, sidewalk, and vegetation along State Street.



Photograph 58: Fence, sidewalk, and vegetation along State Street.



Photograph 59: Fence, sidewalk, and vegetation along State Street.

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 60: Fence, sidewalk, and vegetation along State Street.



Photograph 61: Fence, sidewalk, and vegetation along State Street.



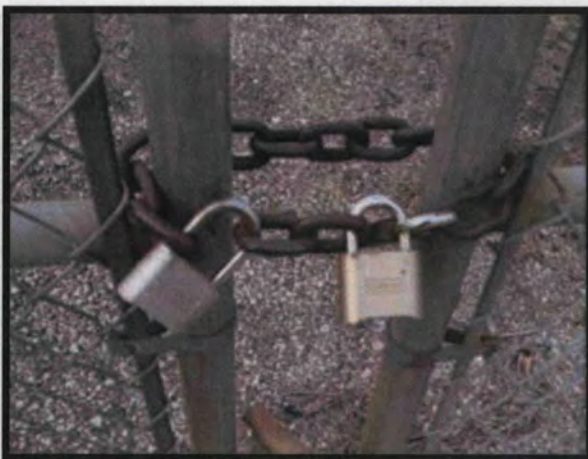
Photograph 62: Fence and sidewalk along State Street.



Photograph 63: Fence along former Rich Oil property.



Photograph 64: Fence, sidewalk, and vegetation along State Street.



Photograph 65: Lock on gate (1555 State Street).

Attachment 4
Taracorp Pile Cap/Main Industrial Site Photographs (November 4, 2013)



Photograph 66: Front gate (view from State Street).



Photograph 67: Fence, sidewalk, and vegetation along State Street (previous hole filled with crushed stone by Munie personnel in 2007).



Photograph 68: Fence and vegetation along railroad tracks and 16th Street.



Photograph 69: Fence and vegetation along railroad tracks at 16th Street.



Photograph 70: Former gas utilities along railroad tracks.



Photograph 71: Fence and vegetation along railroad tracks and 16th Street.

Attachment 5
Eagle Park Acres Remote Fill Properties Photographs (November 4, 2013)



Photograph 1: 200 Harrison Street, also known as 200 Roosevelt Street (view from Roosevelt Street).



Photograph 2: 200 Harrison Street, also known as 200 Roosevelt Street (view from Harrison Street).



Photograph 3: 200 Harrison Street, also known as 200 Roosevelt Street (view from Harrison Street).



Photograph 4: 206 Terry Street (view from Terry Street).



Photograph 5: 206 Terry Street (view from Terry Street).



Photograph 6: 200 Allen Street (view from Terry Street).

Attachment 5
Eagle Park Acres Remote Fill Properties Photographs (November 4, 2013)



Photograph 7: 200 Allen Street (view from Allen Street).

Attachment 6
Schaeffer Road Photographs (November 4, 2013)



Photograph 1: Schaeffer Road property.



Photograph 2: Schaeffer Road property.



Photograph 3: Schaeffer Road property.



Photograph 4: Schaeffer Road property.



Photograph 5: Schaeffer Road property.



Photograph 6: Schaeffer Road property.

Attachment 6
Schaeffer Road Photographs (November 4, 2013)



Photograph 7: Schaeffer Road property.

Attachment 7
Sand Road Photographs (November 4, 2013)



Photograph 1: Sand Road property.



Photograph 2: Sand Road property.



Photograph 3: Sand Road property.



Photograph 4: Sand Road property.



Photograph 5: Sand Road property.



Photograph 6: Sand Road property.

Attachment 7
Sand Road Photographs (November 4, 2013)



Photograph 7: Sand Road property.



Photograph 8: Sand Road property.



Photograph 9: Sand Road property.

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
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Telephone: (610) 670-7310
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January 2, 2014

By Electronic Mail and First Class Mail

Ms. Sheri L. Bianchin
Remedial Project Manager
Institutional Controls Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604

**Re: NL Industries/Taracorp Superfund Site; Granite City, Illinois
Consent Decree Quarterly Progress Report 32 (October – December 2013)**

Dear Ms. Bianchin:

As required by the Consent Decree for the NL Industries/Taracorp Superfund Site (the "site"), two copies of this letter are submitted, on behalf of the NL Industries/Taracorp Superfund Site Group ("Group"), to provide the U.S. Environmental Protection Agency ("EPA") with a quarterly progress report for the Supplemental Environmental Project ("SEP"), operation and maintenance, and other activities that were performed during the period from October – December 2013.

1. Actions Taken During Previous Quarter to Comply with the Consent Decree:

- **SEP:** During the period from October – December 2013, the Madison County Community Development ("MCCD") continued to seek additional applicants for participation in the SEP. For the project to date, MCCD has completed lead paint risk assessments at 118 properties and lead paint abatement at 115 properties.
- **Residential Soil Sampling:** In October 2013, the Group's consultant, Environmental Works, Inc. ("EWI"), collected soil samples at the 1731 Chestnut Street property in Granite City after the Group received access from the property owner. EWI submitted the soil samples for laboratory testing and, upon receipt of data, continued to prepare a report to document the results from previous soil sampling activities.
- **Operation and Maintenance:** During the period from October – December 2013, the following operation and maintenance activities were performed at the site:

October 9	The Group's project coordinator sent an email to advise the Granite City Sanitation Department that the Group's contractor, Munie Greencare Professionals ("Munie"), planned to cut the vegetation at the 1555 State Street property, including the Taracorp pile, on or before October 14, 2013.
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October 10	Munie cut the vegetation at the 1555 State Street property.
October 15	The Group's project coordinator sent an email to advise the Granite City Sanitation Department that Munie completed efforts to cut the vegetation at 1555 State Street on October 10, 2013.
November 5	The Group's project coordinator performed the second 2013 semi-annual operation and maintenance inspection at the site.
November 8	The Group's project coordinator sent a letter to EPA and Illinois EPA to provide copies of log sheets, notes, and reproductions of photographs documenting the results of the November 5 semi-annual operation and maintenance inspection at the site.
November 8	At the request of EPA's project manager, the Group's project coordinator sent a letter to EPA and Illinois EPA to provide a CD containing 145 photographs taken at the site during the November 2013 semi-annual operation and maintenance inspection.

- **Project Coordination:** During the period from October – December 2013, the Group's project coordinator communicated with the following parties regarding work at the site:

October 1	Sent emails to the Madison County trustee and EPA's project manager to confirm that EWI planned to collect soil samples at the 1731 Chestnut Street property in Granite City on October 9, 2013.
October 3	Issued SEP Quarterly Progress Report 3, prepared by MCCD, to EPA.
October 3	Submitted Quarterly Progress Report 31 to EPA.
October 15	Sent a letter to the new owner of the residential property at 1734 Olive to seek access for remedial activities.
October 21	Sent email to EPA and Illinois EPA in regard to the schedule for the five-year review site visit and potential meeting with the Mayor of Venice.
October 24	Participated in a conference call with EPA, Illinois EPA, and Group representatives and discussed five-year review activities.
October 30	Spoke to the Mayor of Venice and EPA's project manager and subsequently sent an email to EPA, Illinois EPA, and the Group to confirm the schedule for the five-year review site visit on November 6, 2013.
November 1	Received an email from EPA's project manager regarding comments on the draft Venice roadways ordinance. After EPA's comments were addressed, sent a letter to the Mayor of Venice to provide a copy of the draft Venice roadways ordinance.
November 4	Sent an email to EPA and Illinois EPA to provide a copy of the letter and draft Venice roadways ordinance that were provided to the Mayor of Venice on November 1.
November 4	Sent an email to EPA and Illinois EPA to provide travel directions to the 1555 State Street property for the five-year review site visit.

November 4	Sent an email to the Madison County trustee to provide preliminary, non-validated data from soil testing performed in October 2013 at the 1731 Chestnut Street property in Granite City.
November 4	Sent an email to EPA's project manager, in response to discussions during the October 24 conference call, to summarize the results from residential soil sampling activities performed during the previous two five-year reviews at the site.
November 6	Participated with representatives of EPA, Illinois EPA, and the Group in EPA's five-year review site visit, which included an examination of Venice alleys, Slough Road, Eagle Park Acres (remote fill properties, Watson Alley, and properties where soil from Madison County's sanitary sewer installation project had been placed and has since been removed), the main industrial site (1555 State Street property and Taracorp pile), Schaeffer Road, and Sand Road.
November 6	Participated with representatives of EPA, Illinois EPA, and the Group in a meeting with the Mayor of Venice related to the draft Venice roadways ordinance.
November 7	Received an email from Illinois EPA that included an updated version of the Illinois model for environmental covenants.
November 13	Sent an email to EPA's project manager to respond to an inquiry regarding the Group's annual operation and maintenance costs at the site.
November 13	Sent an email to EPA and Illinois EPA to provide an updated draft version of the environmental covenant for the US Carriers property at Slough Road.
November 14	Sent an email to EPA and Illinois EPA to provide an agenda for the November 18 conference call.
November 15	Received an email from EPA's project manager that included: (1) EPA's newspaper advertisement announcing the start of EPA's five-year review; and (2) the roster from the five-year review site visit on November 6.
November 15	Sent an email to EPA and Illinois EPA to provide a data table summarizing the results of 2011-2013 soil sampling activities at 18 residential properties located adjacent to previously remediated or to-be-remediated residential properties (where the 2011-2013 soil sampling results indicate either no further action is necessary or drip zone only remediation is required).
November 18	Participated in a conference call with EPA, Illinois EPA, and Group representatives and discussed the five-year review site visit, the status of efforts to implement institutional controls, and follow-up activities.
December 10	Sent an email and letter to the Madison County trustee to provide data from soil sampling activities performed at the 1731 Chestnut Street property in Granite City in October 2013. A copy of the data was also provided to EPA and Illinois EPA.
December 31	Sent a letter to EPA to provide Johnson Controls, Inc.'s Form 10-K Report to satisfy the financial assurance requirements of the Consent Decree.

During November – December 2013, the Group's project coordinator also solicited proposals from prospective contractors for groundwater sampling and related activities to be performed as part of the five-year review. In addition, the Group's project coordinator initiated efforts in December 2013 to prepare a five-year summary report in response to a previous request from EPA's project manager.

2. **Summary of Data and/or Results of Sampling and Tests Received:**

- As indicated above, the Group's project coordinator sent an email and letter in December 2013 to the Madison County trustee to provide laboratory data from soil sampling performed at the 1731 Chestnut Street property in Granite City in October 2013. A copy of the data was also provided to EPA and Illinois EPA.

3. **Work Plans, Plans, and Other Deliverables Completed and Submitted to EPA During the Previous Quarter:**

- Not applicable for this reporting period.

4. **Actions, Data Collection, and Implementation of Work Plans and Other Information Related to the Progress of Construction which are Scheduled to be Performed During the Next Six-Week Period:**

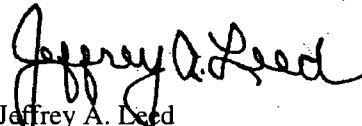
- The Group will continue to perform operation and maintenance activities at the site.
- The Group will respond to questions, if any are received from EPA, in regard to the five-year review. Also, the Group will prepare and submit a five-year summary report to EPA. The Group will select a consultant and submit a letter to EPA to outline the groundwater activities that the Group will perform in conjunction with the five-year review.
- The Group will continue to seek access from the owners of residential properties for soil sampling and remediation, if necessary, and will provide periodic updates to EPA. The Group and EWI will continue to prepare a report to document the results from soil sampling activities at 73 residential properties in April – May 2011, September 2012, June 2013, and October 2013. At the present time, the Group anticipates that the report will be finalized and submitted to EPA in January 2014.
- The Group and EPA will continue to discuss efforts to obtain access to the 18 (of 94) remaining residential properties to which the Group has not obtained access.
- Upon receipt of EPA's comments, the Group will finalize the draft environmental covenant, the draft ordinance for the Venice roadways, the draft Institutional Controls Work Plan, and the draft Communication Plan for Venice Alleys.
- Upon receipt of EPA's approval of the scope of the one-call notification program, the Group will finalize a services agreement and authorize e-Locate Services to implement the program.

- The MCCD will continue to implement the SEP and seek additional participants in the SEP. The Group will provide copies of MCCD's progress reports to EPA on a quarterly basis.
 - The Group will respond to EPA's comments, if any are received, on Addendum 1 to the SEP Work Plan, which was issued to EPA on November 11, 2011, to request EPA's approval of the procedure to be used by MCCD for soil sampling within the drip zones of homes being addressed as part of the SEP.
 - The Group will continue to work with EPA to develop a program for institutional controls at the site and will continue to update EPA with periodic status reports and during conference calls.
5. **Problems Encountered, Anticipated Problems, Actual or Anticipated Delays, and Efforts Developed or Implemented to Mitigate Delays:**
- As previously reported, the level of public participation in the SEP has been less than originally anticipated by the MCCD. The MCCD will continue efforts to attempt to obtain additional participation. The Group will continue to advise EPA regarding MCCD's efforts and schedule.
6. **Modifications to Work Plans or Schedules Proposed to EPA or Approved by EPA:**
- Not applicable for this reporting period.
7. **Community Relations Activities During Previous Month or to be Undertaken During Next Six-Week Period:**
- As indicated above, the MCCD is continuing to attempt to encourage other homeowners to participate in the SEP.

Should you or your staff have questions or comments regarding this progress report, please contact this office at (610) 670-7310.

Very truly yours,

LEED ENVIRONMENTAL, INC.


Jeffrey A. Deed
Project Coordinator

cc: Mr. Doyle Wilson - Illinois EPA (by electronic mail and first class mail)
Technical Committee, NL Industries/Taracorp Superfund Site Group
(by electronic mail)

Appendix G

Soil Sampling Report

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

**Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
Reading, PA 19609
Telephone: (610) 670-7310
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January 6, 2014

By Electronic Mail and First Class Mail

Ms. Sheri L. Bianchin
Remedial Project Manager
Institutional Controls Coordinator
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604

**Re: NL Industries/Taracorp Superfund Site; Granite City, Illinois
Soil Sampling and Analysis Report**

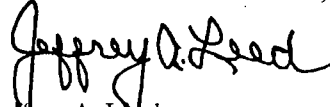
Dear Ms. Bianchin:

Enclosed are two CDs, each containing a copy of the Soil Sampling and Analysis Report which was prepared by Environmental Works, Inc. on behalf of the NL Industries/ Taracorp Superfund Site Group to document the results from soil sampling activities performed at 73 residential properties (reported as 71 residential properties) at the NL Industries/Taracorp Superfund Site in April-May 2011, September 2012, June 2013, and October 2013.

Please let me now if you have questions.

Very truly yours,

LEED ENVIRONMENTAL, INC.



Jeffrey A. Leed
Project Coordinator

enclosures

cc: Mr. Doyle Wilson - Illinois Environmental Protection Agency
(with two CDs, by first class mail)
Ms: Meredith Kenworthy/Ms. Barbara Garcia – Environmental Works, Inc.
(with CD, by first class mail)
Technical Committee, NL Industries/Taracorp Superfund Site Group
(with CD, by first class mail)

SOIL SAMPLING AND ANALYSIS REPORT

**NL INDUSTRIES, INC./
TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS**

January 2014

Prepared For:

NL INDUSTRIES/TARACORP SUPERFUND SITE GROUP

Submitted By:

**ENVIRONMENTAL WORKS, INC.
1455 EAST CHESTNUT EXPRESSWAY
SPRINGFIELD, MISSOURI 65802**

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Appendix E Residential Property Maps and Sample Locations
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1 INTRODUCTION

On behalf of the NL Industries/Taracorp Superfund Site Group (Group), this report has been prepared by Environmental Works, Inc. (EWI) to describe soil sampling activities completed in accordance with Section 9 of the Institutional Controls Work Plan (ICWP) for residential properties at the NL Industries/Taracorp Superfund Site (Site) in Granite City, Illinois (Figure 1).

Section 9 of the ICWP was approved by the United States Environmental Protection Agency (EPA) in March 2011. The scope of work therein outlined the activities to be performed and defined the procedures to be used by the Group and its contractor, EWI, to collect and analyze soil samples from selected residential properties. Beginning in October 2010 and prior to initiating sampling activities, the Group made several attempts to contact the following residential property owners in order to obtain permission to access the properties for soil sampling activities:

- Eighty-four properties (Table 1) where the property owners previously denied access to the Group for soil sampling and/or remediation during previous remedial activities performed at the Site; and
- Nine supplemental environmental project (SEP) properties (Table 2).

A summary of the Group's efforts to obtain access is included in Section 2. One additional property was added to the list of properties to be sampled per the owner's request (Table 3). The aerial extent of the properties considered for potential remedial activities pursuant to the ICWP is shown on Figure 2.

Of the 94 properties listed in Tables 1-3, soil sampling was conducted by EWI at 62 properties (see Section 3 and 4) from April 11, 2011 to May 19, 2011. Seven additional properties were sampled on September 19-20, 2012, three properties were sampled on June 10-11, 2013, and one additional property was sampled on October 9, 2013. Large-scale insets showing the 94 properties are provided on Figures 3a through 3e. Based on the analytical results, 34 properties (addressed in this report as 32 properties because the properties at 818/820 Madison Avenue were combined and the properties at 2410/2412 West 20th Street were combined, due to conditions at the properties) meet the requirements set forth in the ICWP for remediation (see Section 6) and 16 property owners have been referred to the Madison County Community Development (MCCD) for potential drip zone soil remediation as part of the SEP.

This report includes a summary of the methods used to complete soil sampling, the quality assurance and quality control objectives, analytical results and calculated volumes of soil requiring remediation.

1.1 SITE LOCATION AND HISTORY

As described within the ICWP, the Site is located in a heavily industrialized section of Granite City, Illinois; a community of approximately 40,000 people located about two miles east of St. Louis, Missouri. Secondary lead reclamation operations were performed by NL Industries at the main industrial site located at 16th Street and Cleveland Boulevard in Granite City from 1903 to 1983. From the 1950s until 1983, lead-acid battery breaking operations were performed in conjunction with secondary lead reclamation activities at the Site. Between 1981 and 1983, St. Louis Lead Recyclers, Inc. (SLLR) separated various components of an on-site waste pile in order to recycle lead-containing materials, hard rubber battery cases, and plastic battery cases.

In December 1982, EPA proposed to include the Site on the National Priorities List (NPL). In May 1985, a former owner of the Site, NL Industries, Inc., voluntarily entered into an Agreement and Administrative

Order by Consent with EPA and the Illinois Environmental Protection Agency (Illinois EPA) to perform a remedial investigation and feasibility study (RI/FS) for the Site. The Site was added to the NPL in 1986. NL Industries initiated the remedial investigation in January 1987. EPA selected the remedy for the Site and issued a Record of Decision (ROD) in March 1990 and a Unilateral Administrative Order (UAO) in November 1990. After EPA rejected an offer from a group of potentially responsible parties (PRPs) to perform a portion of the required work, EPA initiated and performed remedial activities at 738 properties from 1993 to 1998.

In 1994 and as a result of on-going litigation with the PRPs, EPA reopened the ROD and accepted public comments. In September 1995, EPA reaffirmed the remedial action plan and added a groundwater containment component in a Decision Document/Explanation of Significant Differences.

During the period from June 1998 to May 2000, the Group performed remedial activities at the Site with oversight provided by EPA and the Army Corps of Engineers. The work performed by the Group included remedial activities associated with 802 residential lots (770 stack emission lots and 32 remote fill lots) and paving of 21 alleys not previously addressed by EPA. In addition, the Group performed the following activities at the main industrial site:

- Consolidation of on-site hazardous materials into the existing Taracorp pile.
- Construction of a new cell with an engineered RCRA-grade liner and a leachate collection system.
- Construction of an engineered RCRA-grade cap over the entire pile.
- Construction of storm water and erosion controls on and around the capped pile.
- Restoration of the site.

During the time that remedial activities were being performed, the Group was unable to obtain access pursuant to the Consent Decree from the owners of 84 residential lots, which were subsequently identified as "denied access" properties. Since the time that remedial activities were completed, the Group has conducted post-remediation operation and maintenance activities at the Site pursuant to an Operation and Maintenance Plan approved by EPA.

As part of EPA's 2003 – 2004 five-year review for the Site, the Group conducted soil sampling in 2003 at 50 remediated residential lots and remote fill properties to confirm that the remediated properties had not become recontaminated. The results of the 2003 soil sampling activities were presented in a report entitled 5-Year Review Final Report for the NL Industries/Taracorp Superfund Site, which was prepared by ENTACT, Inc. (ENTACT) on behalf of the Group and submitted to EPA in September 2003. The results of the 2003 sampling event indicated that the total lead concentrations in the soil samples collected from the previously remediated properties were all less than EPA's remedial action objective, 500 milligrams per kilogram (mg/kg), except for 4 soil samples collected from drip zones at the properties. The report indicated that the presence of lead in the drip zone samples may have been attributable to factors unrelated to the Site, such as lead-based paint on the exterior of the homes.

In 2004, the Group contracted with the Madison County Community Development (MCCD) to implement a Supplemental Environmental Project for lead paint abatement for the Site. The work associated with the SEP is described in additional detail in the MCCD's August 2004 SEP Work Plan, which was approved by EPA and subsequently revised several times and resubmitted to EPA. Since the initiation of the SEP work in 2004, the MCCD has performed exterior soil sampling and soil abatement, as necessary, based on the results of its soil sampling activities.

In August 2008, EPA requested that the Group conduct additional soil sampling as part of EPA's 2008 – 2009 five-year review to confirm that the soil at remediated properties located adjacent to denied

access properties had not become recontaminated. The results of the five-year testing indicated that the total lead concentrations in soil samples collected at all residential property locations were below 500 mg/kg total lead except for drip zones samples at two of the properties. The report confirmed the results from previous sampling which indicated that the lead in the drip zone samples may be ascribed to factors unrelated to the former industrial operations at the Site, such as lead-based paint used on the exterior of the homes.

As part of the Group's efforts to implement institutional controls for the Site, EPA determined in February 2008 that SEP soil abatement activities would be more effectively implemented as part of the ICWP. Therefore, the SEP soil sampling activities were incorporated into the revised ICWP submitted to EPA. The procedures for addressing the soil at the 9 SEP properties, the 84 properties where owners previously denied access, and the one additional property are described in further detail within Section 9 of the ICWP approved by EPA. This report summarizes the soil sampling procedures and the results of soil sampling performed pursuant to Section 9 of the ICWP.

1.2 DOCUMENT ORGANIZATION

This document is composed of the following sections, tables, figures, and appendices:

- Section 1:** Introduction to the purpose and organization of the document;
- Section 2:** Summary of pre-sampling activities, including property access and health and safety considerations;
- Section 3:** Summary of soil sampling and analysis activities completed during field events;
- Section 4:** Summary of analytical results;
- Section 5:** Summary of data quality objectives (DQOs) evaluation;
- Section 6:** Summary of the report;
- Tables:** Tables 1 through 10 present information regarding properties and locations sampled, attempts to gain access, sampling strategies, analytical results, soil remediation requirements, and quality assurance objectives and results;
- Figures:** Figures 1 through 3 depict Site features and locations of residential properties;
- Appendix A:** Includes copies of signed access agreements;
- Appendix B:** Consists of the Site-specific health and safety plan;
- Appendix C:** Consists of the analytical laboratory reports;
- Appendix D:** Provides photographic documentation;
- Appendix E:** Includes residential property maps; and,
- Appendix F:** Includes maps of all properties where soil remediation is warranted as described in the ICWP.

2 PRE-SAMPLING ACTIVITIES

This section presents a summary of pre-sampling activities performed by the Group and EWI. Section 2.1 describes activities associated with residential property access. Section 2.2 provides information regarding health and safety. Section 2.3 provides information regarding initial backfill sampling.

2.1 RESIDENTIAL PROPERTY ACCESS

Prior to initiating soil sampling activities, the Group attempted to obtain signed access agreements from residential property owners listed on Table 1, Table 2 and Table 3. These attempts consisted of:

- Letters issued in October 2010;
- Follow-up letters issued in January 2011 to those property owners from whom signed access agreements had not been returned; and
- Telephone calls to attempt to obtain oral consent from property owners.

Subsequently, the Group's efforts to obtain access have also included:

- Letters issued by certified mail in June 2011;
- Letters issued by delivery confirmation in September 2011;
- Follow-up letters and emails to property owners;
- Additional efforts to contact property owners by telephone; and
- Communications with the Madison County trustee.

During field activities in April-May 2011, EWI's soil sampling team attempted to obtain consent to sample at the properties where the owners had not yet responded to correspondence from the Group. Access agreement information packets were left on the front door or given to the residents at 31 properties. The field crew made several attempts to contact the owners, including visiting some properties multiple times and leaving additional access agreement packets, when it was deemed necessary. Copies of signed access agreements and the Group's letters confirming access that were sent to several property owners to confirm their oral consent for access are provided in Appendix A.

As of the time of the October 2013 sampling event, permission for access had been obtained to conduct soil sampling/remedial activities at 74 properties (Table 4). Nineteen of the properties had denied access /no response status and one property (1004 Allen) was requested by the Group to be removed from the scope of work because the property does not exist.

Of the 74 properties where access was received from the property owners, 1 property (924 Grand Avenue, Madison, Illinois) was not sampled because it was determined to be a commercial property), and two were combined with adjacent properties.

- Property #46 was combined with Property #47 due to conditions at the properties. Together, these properties were sampled as 818/820 Madison Ave, Madison, Illinois.
- Property #79 was combined with Property #80 due to conditions at the properties. Together, these properties were sampled as 2410/2412 W. 20th St, Granite City, Illinois.

Because four properties were combined into two properties (as indicated above) due to property-specific features, the total number of properties sampled is reported as 71 properties within this document.

Of the properties where the Group was unable to obtain access from the property owners, one property (1427 Iowa, Granite City) was deleted from the Group's institutional controls program because the Madison County government reclassified the former residential property to an industrial use.

On April 1, 2011, the Group mailed a schedule for the upcoming soil sampling activities to all property owners whom had granted access as of the 2011 sampling event. While on-Site at each property during the field event and prior to initiating any soil sampling activities, EWI's soil sampling team attempted to notify the resident directly of the initiation of sampling activities.

On August 31, 2012 the Group mailed a schedule for the upcoming soil sampling activities to the seven property owners whom had granted access since the previous sampling event in 2011. A schedule was mailed on May 30, 2013 to the three property owners of the residential properties for which access was granted between the September 2012 sampling event and May 2013. The Group also provided a schedule to the Madison County trustee prior to soil sampling activities at 1731 Chestnut, Granite City, in October 2013.

2.2 ADDITIONAL NOTIFICATION

Prior to initiating field activities, letters with status information and start dates for field activities were sent to the mayors of Granite City, Madison, and Venice, Illinois. The letters outlined the work that had been completed to date and verified how the EWI sampling crew could be identified in the field. The Group also reiterated that the EWI sampling crew would contact the Joint Utility Locating Information for Excavators, Inc (JULIE) one-call authority to have utilities marked prior to beginning field activities and that the local police department was to be contacted daily.

JULIE one-call notifications were placed prior to initiating field activities to allow member utilities sufficient time to respond. No additional utilities were contacted separately. Prior to beginning soil sampling activities at each property, EWI personnel contacted the police department which had jurisdiction over the areas that soil sampling was to be completed.

2.3 HEALTH AND SAFETY

The Site Safety and Health Plan (SSHP), prepared by EWI prior to the initiation of soil sampling activities in 2011, is included as Appendix B. The SSHP was updated to reflect personnel changes in November 2012. On March 23, 2011, September 5, 2012, June 8, 2013, and October 9, 2013 the EWI project team held mandatory health and safety meetings to discuss the history of the Site, the scope of work to be performed, potential health and safety concerns associated with the project, required level of personal protective equipment, and the procedures for personnel and sampling equipment decontamination. All EWI field team members reviewed the ICWP and SSHP prior to commencement of field activities. Safety meetings were held daily at the Site by the field crew prior to field work.

2.4 BACKFILL SAMPLING

Prior to the initiation of field sampling activities in 2011, EWI personnel collected and submitted for analysis a sample of the topsoil intended to backfill the small boreholes that resulted from soil sampling activities. The initial topsoil, which was purchased from a retail store in Springfield, Missouri, contained a lead concentration of 6.4 mg/kg. During the first week of sampling, EWI field personnel purchased additional topsoil from a retail facility in the St. Louis area and a second backfill sample was submitted to the laboratory for analysis. The concentration of lead was reported as 25.4 mg/kg. No additional soil samples from the backfill topsoil were submitted to the laboratory for analysis until soil sampling was

initiated again in 2012. On September 19, 2012, a soil sample from topsoil purchased in Springfield, Missouri was submitted for analysis. The topsoil contained 6.5 mg/kg of lead. This was the only brand of topsoil utilized during the September 2012 sampling event; therefore no additional samples were submitted for analysis. The same brand of topsoil was used for the 2013 soil sampling activities as for the 2011 sampling. A sample of this soil was submitted following the October 2013 sampling event; this soil contained 25.2 mg/kg of lead. All of the backfill soil samples contained lead concentrations well below EPA's 500 mg/kg remedial action objective for the Site. Analytical laboratory reports are included within Appendix C.

3 SOIL SAMPLING PROTOCOL

The objective for residential soil sampling was to obtain representative soil samples from residential properties where the owner had granted permission for sampling. The soil sampling team collected and managed samples in accordance with the approved ICWP in order to meet this objective. This section summarizes the soil sampling process completed at properties sampled between April 11, 2011 and May 19, 2011, on September 19-20, 2012, on June 10-11, 2013 and on October 9, 2013. Section 3.1 includes a discussion of field sampling activities, Sections 3.2 and 3.3 summarize sample handling and decontamination processes, and Section 3.4 includes information regarding field documentation.

3.1 SAMPLING APPROACH

Section 9.6 of the ICWP describes 2 soil sampling approaches to be used depending on the size of the property. Properties smaller than 6,500 square feet were sampled using the front yard, side yard, back yard method (yard approach), and properties greater than 6,500 square feet were sampled using the quadrant method (quadrant approach). Details regarding the soil sampling strategy for lots less than 6,500 square feet and greater than 6,500 square feet are provided in Section 9.6.2 and Section 9.6.3 of the ICWP, respectively. Tables 5 and 6, which are reproduced from the ICWP Tables 11 and 12, summarize the sampling strategies employed at residential properties. During sampling activities, the Group approved, following consultation with EPA as necessary, minor adjustments from the sampling approach based upon field observations that allowed, under specific circumstances, the application of the quadrant approach on lots less than 6,500 square feet. These are detailed in Section 4.

3.2 SAMPLE COLLECTION AND HANDLING

Prior to initiating work at each property, the field sampling team attempted to contact the property residents in person that soil sampling activities would be performed. Once completed, the field crew verified utility locates and determined the sampling approach to be used. The crew compared the property layout to an aerial photo and noted discrepancies (building additions, trees, concrete pads, etc.). The crew then established aliquot sample points (placed flags). The distances between aliquot points and to pertinent property control points were measured using a measuring wheel. The locations and measured distances of these points were documented on an aerial photograph for each property. Any concerns such as old cars, oil staining, holes, evidence of old driveways or patios, etc. were documented. Each property was photographed per the ICWP.

Sample log sheets were prepared for each property sampled including associated quality control samples collected. A running count of quality control samples was maintained in order to meet ICWP required DQOs which are discussed further in Section 5. Quality control samples were collected in accordance with the ICWP as follows:

- Field blank samples (equipment rinsate samples) were collected at a rate of one per day of sampling.
- Field duplicate samples and matrix spike/matrix spike duplicate (MS/MSD) samples were generally collected for every twentieth soil sample.

Soil samples were labeled according to the designated identification coding system outline in Table 13 of the ICWP. However, due to character limits for sample identifications on the laboratory reports, two field duplicates have only the addition of "F" following the sample name. The names as they appear on

the final laboratory reports are as follows: RP 1736/1738 CHESTNUT ST-Q2-0-3-F and RP-2410/2412 W 20TH ST-Q4-6-12-F. This has been corrected for consistency in Table 7.

Soil aliquot samples were manually collected at each sampling location by the direct push method of a stainless steel split spoon sampler into the soil. The aliquot samples for each sample location were transferred to decontaminated stainless steel bowls, one for each sample depth per yard, quadrant, or zone. Any vegetative material, rocks, and debris were removed from the bowl per the ICWP. Aliquots were thoroughly mixed to achieve a homogenous blend to the maximum extent practicable. Once a sample was homogenized, it was placed in an unpreserved, laboratory provided glass sample container. A sample identification number was assigned in accordance with the sample identification system described in the ICWP. A sample label was prepared and affixed to the sample container to identify sample number, sampler's name, date and time of sample collection, sampling location, and project identification data. The labels were affixed to the sealed containers to ensure custody.

Each jar was sealed in a plastic bag and placed in a cooler in preparation for shipment. Chain-of-custody (COC) forms provided by Pace Analytical Services, Inc. were completed in real-time as samples were prepared in order to minimize the loss or misidentification of samples and to ensure that unauthorized persons did not tamper with collected samples. The COC forms were completed in accordance with the ICWP and copies of the forms are included with the analytical laboratory reports in Appendix C.

Any remaining soil which was not used to fill sample jars was returned to its respective zone for use as backfill. The top of each boring was backfilled to grade using topsoil (See Section 2.3) purchased in bags from a local, commercial supplier. Grass seed was scattered atop the soil.

The samples were packaged to prevent damage or breakage during transport and hand-delivered to Pace Analytical Services, Inc.:

Pace Analytical Services, Inc. – St. Louis
4120 Seven Hills Drive
Florissant, MO 63033

From there, Pace Analytical Services, Inc. (Pace) personnel shipped the samples to the Pace environmental laboratory located in Lenexa, Kansas:

Pace Analytical Services, Inc.
9608 Loiret Boulevard
Lenexa, KS 66219

where the samples were analyzed for total lead analysis using EPA method 6010B. The soil samples were analyzed with standard laboratory analysis time and a level 2 quality assurance package requested. Section 5 includes additional information regarding project DQO.

3.3 SAMPLE EQUIPMENT DECONTAMINATION

All reusable sampling equipment was decontaminated at the sample location to minimize the potential for sample cross-contamination. Per the ICWP, the following process for decontamination was utilized:

- All visible large debris was manually removed from the sampling tool.
- The tool was washed in a plastic pail using an Alconox detergent/potable water solution.
- After the detergent wash, the tool was triple rinsed with potable water over a plastic pail.

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- The tool was rinsed again using distilled water and air-dried or dried with disposable paper towels.

After decontamination, the sampling equipment was stored in plastic sampling totes between sampling events. All decontaminated equipment within the sampling totes was placed in individual plastic bags and/or wrapped in disposable towels. The sampling totes were decontaminated at the end of each day to ensure cleanliness. Used paper towels and other waste items were disposed off-site.

3.4 FIELD DOCUMENTATION AND RECORD KEEPING

All field sampling activities were documented in a bound, field logbook with consecutively numbered pages, per the ICWP, and included the following information.

- Name of the author;
- Date and time of entry;
- Property address / location of activity;
- Names and affiliations of personnel on-Site;
- Sample collection or measurement methods;
- Number of samples collected;
- Daily weather report;
- Sample identification information;
- Sampling depth increment for soil samples;
- Field observations and comments;
- Locations of photographs; and,
- Any deviations from the sampling plan.

Photographic documentation of field activities is provided in Appendix D. The utility location records for each property have been retained with the field logbook and all other records generated throughout the duration of this project. These records are on file at the EWI Corporate Office located in Springfield, Missouri.

A list of the properties sampled and the associated laboratory results were submitted to the Group for review prior to preparation of this report. This information was subsequently submitted by the Group to EPA as specified in the ICWP. One file copy of this report will be maintained within the project file at the EWI Corporate Office.

4 SOIL SAMPLING RESULTS

The purpose of this section is to provide a summary of the results of residential soil sampling efforts which occurred during April and May 2011, on September 19-20, 2012, June 10-11 and October 9, 2013. Section 4.1 provides information regarding the properties sampled and the sampling approach employed. Section 4.2 provides a summary of the analytical data set and the remediation required per the ICWP.

4.1 PROPERTIES SAMPLED

Sampling activities were initiated on April 11, 2011 and continued for five weeks through May 19, 2011. Additional mobilizations and soil sampling occurred on September 19 and 20, 2012, June 10, 2013, and October 9, 2013. During the 2011 sampling period, efforts were delayed several times primarily due to severe weather, including a tornado outbreak. The 2012 sampling events were initiated following the acquisition of seven additional access agreements; the 2013 sampling events were conducted following the receipt of four additional access agreements.

Of the properties for which access was obtained, a total of 73 properties were sampled. Because four properties were combined into two properties due to property-specific features, the total number of properties sampled is reported as 71 properties within this document (see Section 2.1). Of the access agreements that were signed and provided to the Group by the property owners, one property, 924 Grand Avenue, Madison, Illinois was not sampled. The Group determined this property was being used for commercial purposes and has no residential use, and therefore is out-of-scope.

According to the sampling protocol outlined in the ICWP, for properties less than 6,500 square feet, soil samples were collected from the front yards, back yards, two side yards (when side yards were present and substantial in size), drip zones, bare play areas, and vegetable gardens (where applicable). A total of 45 properties (64%) were sampled using the yard approach. Of these properties,

- Two vegetable garden and three bare play areas were sampled;
- Twenty two properties (48.8%) did not have side yards of sufficient size for sampling;
- Twenty one properties (46.6%) had only one side yard of sufficient size for sampling; and
- Two properties (4.4%) had samples collected from both side yards.

For properties greater than 6,500 square feet, EWI collected soil aliquots from each of the four quadrants as well as drip zones, bare play areas and vegetable gardens where applicable. Twenty-five (36%) properties were sampled using this approach. Of these properties, one bare play area and one vegetable garden was sampled. Of the 25 properties sampled using this approach, 7 properties were smaller than 6,500 square feet; however, due to property-specific circumstances, listed as follows, the quadrant sampling approach was used:

- Seven properties smaller than 6,500 square feet were sampled using the quadrant approach because no structure existed on those properties: 1427 Madison Avenue, Madison, Illinois; 905 Madison Avenue, Madison, Illinois; 1736/1738 Chestnut, Granite City, Illinois; 524 Meredocia St., Madison, Illinois; 1003 Grand Avenue, Madison, Illinois; 1007 Grand Avenue, Madison, Illinois and 1731 Chestnut Street, Granite City, Illinois.

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- The structure at 1643 Delmar, Granite City, Illinois, is located on one side of the property creating one large yard. Because of this unique circumstance, the yard was sampled using the quadrant approach, although the property is smaller than 6,500 square feet.

The Group and EPA provided approval of the adapted sampling approach. An adapted sampling approach was also approved for the triangular shaped property at 908 Reynolds Street, Madison, Illinois. This property was divided into trisects rather than quadrants and sampled using the quadrant sampling protocol in each section.

Soil samples were not collected from areas that were in close proximity to any painted surfaces or other potential sources of lead unrelated to the Site. Approximately 60% of the sampled properties with a residential dwelling had concrete walk ways, drive ways, or had other obstructions along some portion of the drip zone or no drip zone; therefore, 4-point composite drip zone samples (e.g., one sample from each side of the dwelling) could not be collected. Most drip zone samples were collected as either 2- or 3-point composites; however, 6-point composite drip zone samples were collected at 1318 Grand Avenue due to the presence of two residential structures located on the property. Drip zone samples were not collected at 15 properties; nine of those properties had no structure on the property and six had obstructions on all four sides of the residential dwelling.

During all soil sampling activities, every effort was made to maintain even distribution of the sample aliquots; however, locations were selected also to account for obstructions, landscaping, or non-soil ground cover. The locations of all sample aliquots are shown on the individual property maps in Appendix E. The results from laboratory testing of the soil samples are summarized in Section 4.2.

4.2 ANALYTICAL RESULTS AND REMEDIATION

Upon receipt of laboratory data, EWI compared the results to the remedial action objective (500 mg/kg) in accordance with the requirements outlined in the ICWP. All data reduction and validation activities were performed as outlined in the ICWP. A summary of the soil sampling analytical results is provided in Table 7. The following observations can be made from these results:

- Total lead concentrations in soil samples collected at 23 of the 71 property locations were at or below 500 mg/kg.
- Forty-eight properties of the 71 properties sampled exhibited total lead concentrations that exceeded 500 mg/kg in one or more samples collected at the properties. Of the 48 properties, 16 properties (33%) exhibited total lead concentrations above 500 mg/kg within the drip zone samples only, and 32 properties (67%) exhibited total lead concentrations above 500 mg/kg in the yard, quadrant, and/or other sampled areas.
- The presence of lead in drip zone soil samples may be attributable to factors unrelated to the former industrial operations at the Site, such as lead-based paint on the homes.

Based on the results of soil sampling activities, the Group sent letters to the property owners as follows:

- Letters were sent to 23 property owners to advise them that because the lead concentrations in soil samples are below 500 mg/kg, no remediation is required on their properties.
- For the 16 properties where the lead-in-soil concentrations were above 500 mg/kg only in the drip zone of their homes, the Group sent letters to the property owners indicating that the results suggest that the soil in the drip zones has likely been affected by lead-containing paint that was used to paint the outside of their homes. In the letters, the Group encouraged the

property owners to contact the MCCD to determine whether the MCCD's Lead Program may be able to help them to identify, remove, or stabilize lead-based paint hazards at their homes.

- For 32 properties where the lead-in-soil samples collected from yard or quadrant areas were above 500 mg/kg, the Group sent a letter to each property owner to advise the owner that the Group would perform remedial activities at a later date.

Table 8 provides a summary of the 32 properties which require remediation. Of the 32 properties, 12 properties were sampled as quadrants and will require remediation of approximately 822 yd³ per the ICWP. The remaining 20 properties that were sampled utilizing the yard approach will require remediation of approximately 493 yd³ of soil. At this time, remediation access has been granted for 25 of these 32 properties. For reference, the properties where access has not currently been granted for remedial action are italicized and marked with an asterisk on Table 8. Should access to complete remedial activities at the aforementioned properties be granted, the total volume of soil requiring remediation would be approximately 1315 yds³. Appendix F includes maps of all properties where soil remediation is warranted.

5 DATA QUALITY OBJECTIVES

All required sampling methodology and documentation requirements were reviewed with the field sampling team during pre-sampling meetings. Quality control samples, which are used to assess potential procedural errors related to sampling or sample handling and to evaluate the reproducibility of the laboratory data, were collected and analyzed in accordance with the procedure outlined in the ICWP as summarized below. Prior to initiation of the field activities, the data quality objectives were provided to and discussed with the analytical laboratory in order to support compliance with the ICWP. A Level 2 DQO package was requested for all laboratory reports in order to support evaluation of Site-specific objectives. Field and laboratory data were assembled and validated according to the ICWP so that the data could be evaluated with respect to the quality assurance objectives, summarized below: precision (Section 5.1), accuracy (Section 5.2), representativeness (Section 5.3), completeness (Section 5.4), and comparability (Section 5.5). In general, this evaluation shows that data meets the stipulated criteria of: (1) quantitative statistical significance; (2) custody and document control; and (3) sample representativeness and is therefore usable for the stated intent. The data presented within this report are provided with confidence that the intent of the quality control objectives of the project has been achieved by both field personnel sampling per the approved sampling design plan and through consistent, EPA-approved laboratory analytical techniques. Laboratory reports are included within Appendix C.

5.1 PRECISION

Precision is a measure of mutual agreement among individual measurements of the sample property (lead concentration). In order to assess precision, field and lab objectives were required by the ICWP.

- **Field duplicate samples:**
 - For the field objective, the ICWP required that field duplicates be collected at a rate of 1 every 20 soil samples collected or for each analytical batch. Forty one duplicate samples were collected for 831 soil samples. Therefore, an average collection frequency of one duplicate for every 20.3 samples was maintained during the sampling period.
 - For the lab objective, a relative percent difference (RPD) between 0% and 30% was considered acceptable for this project. RPD values were calculated for sample/duplicate pairs and matrix spike/matrix spike duplicate pairs. A summary of total lead results for soil samples and duplicate samples is shown on Table 9. The calculated sample/duplicate RPD values ranged from 1% to 89% with an average RPD of 20.2%, median of 14%, and standard deviation of 19.6%.
 - A majority of the duplicate pairs exhibited RPDs well within the project specific precision criteria of 0%-30%. In seven duplicate pairs, the RPD exceeded the 30% threshold. For each of these cases, three duplicate samples exhibited lead concentrations above the associated sample, and all seven duplicate samples exhibited lead concentrations below the 500 mg/kg remedial action objective.
 - It is probable that the seven instances for which the RPD exceeded the 30% threshold were due to inherent micro-heterogeneity within the soil. Lead in the soil presents a common challenge as lead tends to adsorb to clay particles in a soil matrix under a variety of geochemical conditions. Another factor influencing heterogeneity within soil is moisture content; specifically, that heterogeneity may increase with soil moisture.

Results from the lab indicate that the moisture content in the soil samples was approximately 15-20%. Therefore, the ability of the field method to fully homogenize the samples was effectively limited by the moisture content within the soils. As a result of this heterogeneity, considerable variation in lead concentration is possible in soil samples that were used to analyze sample/sample duplicates (and MS/MSDs). For each sample that was analyzed, a relatively small volume of the soil sample was digested by the laboratory. The small volume that was extracted, coupled with the heterogeneity of moist soil, is likely to have influenced the observed differences.

- **Laboratory MS/MSD:**
 - The ICWP required that MS/MSD analysis be completed using Site-specific samples for each analytical batch. Therefore, EWI submitted a sufficient volume of soil to the laboratory for every 20 samples in order to comply with this requirement. A sufficient volume of soil was collected and submitted to the laboratory for total lead analysis of 41 MS/MSD samples. The project average rate of MS/MSD designation was one pair per 20.3 samples.
 - The results of the MS/MSD analyses are provided within the analytical reports in Appendix C. The 2011 and 2013 laboratory reported the RPD for MS/MSD samples based on the precision criteria of 20% RPD; the project specific goals were 0%-30%. Therefore, laboratory results sometimes include qualifiers on MS/MSD pairs that do not exceed the precision goals for this project. The laboratory reported RPD criteria were adjusted for the 2012 sampling event to reflect the project specific goals.
 - A majority of the MS/MSD pairs fell within the project range specification. The calculated Site-specific MS/MSD RPD values ranged from 0% to 84% with an average RPD of 15.9%, a median of 10 and a standard deviation of 18.2. There were eight occurrences of the RPD between the MS and MSD samples exceeding the project precision criteria of 0%-30%. These results are similar to the results of the duplicate-pair RPD results discussed above and likely indicate sample heterogeneity on a micro-scale level with moisture content influence. Sample heterogeneity arising from the spatial distribution of lead in soil in any study area is commonly viewed as a characteristic of the environment being sampled and not necessarily as "interference" that the method of analysis must be optimized to address.
 - Several occurrences of matrix spike recovery qualifiers were noted on the laboratory reports. Specifically, the M1 qualifier designated that the recovery concentration exceeded the laboratory QC limits. However, each analytical batch was validated and accepted based on the appropriate recovery of the laboratory control samples.
- **Laboratory quantitation limits:** Total lead data were reported by the laboratory on a dry weight basis. The laboratory was able to attain limits of quantitation well below 500 mg/kg, per the ICWP.

5.2 ACCURACY

Accuracy is the degree of agreement of a measurement with an accepted reference or true value. The accuracy of the data was assessed by examining the results from the analysis of field blanks, duplicate samples, laboratory MS/MSD samples and the laboratory quality assurance and quality control samples. In order to evaluate accuracy, field and lab objectives were identified in the ICWP as follows.

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- **Adherence to sampling handling procedures:** Accuracy in the field is evaluated by adherence to prescribed sample handling requirements indicated by field documentation and quality control samples. The steps outlined in the ICWP include the proper labeling and packaging of each sample container and the labeling and proper sealing of each shipping container. The sample containers and preservatives were supplied by the laboratory and all of the samples were analyzed within the appropriate holding time.
 - **Field Blank Samples:** To assess potential procedural errors in sampling or sample handling, the ICWP required one field blank to be collected on each day that samples were shipped to the laboratory. To achieve this field QC objective, a total of 25 field rinsate blanks were collected during the course of the sampling activities per the ICWP. Field blank rinsate samples were taken by pouring distilled water over decontaminated sampling equipment (stainless steel split spoon sampler). Field blank samples were containerized in polycarbonate bottles provided by the laboratory and were preserved with nitric acid. In accordance with the ICWP, a field blank rinsate sample was prepared at a rate of one rinsate sample for every day samples were submitted to the laboratory for analysis. Sample labeling and handling procedures were completed in adherence to the prescribed sampling handling requirements outlined in Section 3.2 of this document and the ICWP. All field blank samples were submitted to the laboratory for total lead analysis and results are presented on Table 10. The lab achieved appropriate limits of quantitation with reporting limits ranging from $<0.005 \mu\text{g/L}$ to $<5 \mu\text{g/L}$.
 - All total lead results for the field blank samples were below the laboratory reporting limit with the exception of one detection within a field blank collected on June 10, 2013. The sample was reanalyzed and the detection and concentration were confirmed by the laboratory. Per Table 15 of the ICWP, if the field blank results indicate the accuracy of the analytical results has been compromised, data must be qualified in accordance with EPA functional guidelines for evaluating the data. The EPA guidelines indicate that site samples associated with field blanks are positive results only if the concentration of the chemical in the site sample exceeds five times the maximum amount detected in any blank. All detection of lead within the soil samples associated with the field blank were greater than 5 times the amount in the field blank, therefore all the data associated with the field blank are valid.
 - **Laboratory Control and Method Blank samples:**
 - In accordance with the ICWP, laboratory accuracy was assessed through the analysis of spikes or standard reference materials and the determination of percent recoveries. An acceptable accuracy range for this project is considered to be 75% to 125% recovery.
 - To assess accuracy, the laboratory considers the results of the method QC samples Laboratory Control Sample (LCS) and the Method Blank (MB) samples. Throughout this project, all results of the analyses of these QC samples were found within acceptable ranges; all of the data are acceptable by the laboratory's validation procedures.

5.3 COMPLETENESS

Completeness is the amount of valid data obtained from a measurement system compared to the amount that needed to be obtained to meet the project data goals. Field and laboratory completeness is the measurement of the amount of valid measurements obtained from all the measurements. Per the ICWP, the intent of this project was to attempt to achieve a goal of 100% completeness (however,

because this goal may not be achievable under normal conditions, the completeness goal for this project was defined in the ICWP to be 90%).

- The data were assessed for completeness with respect to sampling method, sample preparation and handling, analytical methods, quality control and documentation. The sampling procedures outlined in the ICWP, including sampling collection, preparation and handling were followed by the EWI sampling crew for the duration of the soil sampling activities. The sampling manager maintained field documentation including sample collection logs, photographic documentation, chain of custody forms, daily safety briefing forms, and QC logs. Each sample collection log included the sample ID, location of the sample, depth, field description of the soil, collection method, time, date, and name of sampler. The field crew completed the chain of custody forms at the time of the sample collection, and the contents of the field logbook were reviewed for completeness at the close of the work day. Any errors were corrected per the ICWP.
- All samples submitted to the laboratory for analysis were processed and the results reported according the methods outlined within the ICWP. All custody documents were reviewed. Laboratory records were reviewed to ensure that data package requirements were met, per the ICWP. Any errors were communicated to the laboratory for correction.
- The overall completeness quality assurance goal was met for this project.

5.4 REPRESENTATIVENESS

Representativeness is the selection of analytical methods and sampling protocols and locations such that results are representative of the media being sampled and conditions being measured. To assess the representativeness of the data set, the ICWP outlined specific field and laboratory objectives to be addressed as follows.

- The sampling protocol adapted for this project was designed within the ICWP to provide a representative data set that would allow the Group to effectively assess the lead concentrations that exist at the residential properties. The sampling method utilized by the soil sampling crew involved the field homogenization of soil aliquots from the designated residential properties. Care was taken to collect soil that was representative of the soil being assessed at each property. Section 3.0 provides further information regarding the approved sampling protocol that was used to collect representative soil samples during sampling activities.
- Field objectives for ensuring representativeness are dependent upon the proper design of the sampling program. These objectives were satisfied by ensuring that the field sampling plan was followed and that proper sampling techniques were used.
- Representativeness in the laboratory was ensured by using the proper analytical procedures, meeting sample holding times, and analyzing and assessing field duplicate samples. The sampling network was designed to provide data representative of conditions at the properties. These considerations were met, providing for the aforementioned limitation of the precision/accuracy assessments due to inherent heterogeneity of the soil samples.

5.5 COMPARABILITY

Comparability is an expression of the confidence with which one data set can be compared to another.

- To assess the comparability of the data collection activities, field sampling protocols and analytical techniques were considered. Comparability is dependent upon the proper design of the sampling program and was satisfied by ensuring that the field sampling plan was followed and that proper sampling techniques were used. The EWI sampling team utilized a systematic sampling protocol per the ICWP sampling design that was presented to and approved by the EPA. Where Site conditions warranted, the sampling design was altered as discussed in Sections 3 and 4.
- Analytical data are comparable when similar sampling and analytical methods are used and documented. To ensure comparability, quality assurance objectives were not altered during this project.
- The results of the laboratory analysis conform to the most current National Environmental Laboratory Accreditation Conference standards: all samples were prepared by EPA method 3050 and analyzed by EPA method 6010B.

As indicated above, and for the reasons defined above, the data presented within this report are provided with confidence that the intent of the quality control objectives of the project has been met. Therefore, the data are usable for their stated intent.

6 SUMMARY

The final version of Section 9 of the ICWP, including the soil sampling procedure, was approved by EPA in March 2011. Pursuant to the ICWP, the Group and EWI obtained access from 74 property owners (1 property was not sampled because it was determined to be a commercial property) and sampled soil to determine the lead concentrations at 73 properties (reported as 71 properties due to combined parcels) of the 84 denied access properties (where the property owners had previously denied access during remedial activities), 9 SEP properties, and 1 additional property.

Of those properties where access was granted, EWI performed soil sampling activities on April 11-May 19, 2011, September 19-20, 2012, June 10-11, 2013 and October 9, 2013. A total of 831 soil samples, 41 field duplicate samples, and 25 field blanks were submitted to the laboratory for total lead analysis. Sampling and analysis were completed as defined within the ICWP.

The data within this report were assembled and validated by EWI and were additionally evaluated based on precision, accuracy, representativeness, completeness, and comparability. These criteria were designed within the ICWP to ensure that field and laboratory quality assurance objectives were met throughout the sampling and analytical process. The results of the data quality evaluation support the usability of the data with respect to the aforementioned quality assurance objectives.

The findings of the 2011, 2012 and 2013 sampling events include the following:

- Twenty-three properties exhibited total lead concentrations below 500 mg/kg in all the soil samples collected at each property.
- Forty-eight properties had soil lead concentrations in one or more samples that exceeded the 500 mg/kg remedial action objective. Of those, 16 properties had soil lead concentrations above 500 mg/kg in the drip zone samples only. For these properties, no remedial action is required as lead in drip zone samples may be attributable to factors other than the former industrial operations at the Site (the owners of those properties have been referred to the MCCC for possible consideration as part of the MCCC's Lead Program). Thirty two properties had soil lead concentrations above 500 mg/kg in one or more samples in the yard or quadrant samples.
- Six properties of the 32 with soil lead concentrations above 500 mg/kg currently have access agreement status of "soil sampling only".

The total estimated volume of soil for excavation at the 32 properties is 1,315 yds³. If access is not obtained for remediation at the six properties where access has been received for "soil sampling only," the volume of soil to be excavated at the remaining properties is 1,168 yds³.

TABLES

Table 1 *Denied Access Properties* (summarizes the Group's efforts to obtain access to 84 denied access properties)

Table 2 *SEP Properties* (summarizes the Group's efforts to obtain access to 9 SEP properties)

Table 3 *Additional Property* (summarizes the Group's efforts to obtain access to one additional property)

Table 4 *Summary of Access Agreement Status*

Table 5 *Soil Sampling Strategy for Lots Less Than 6,500 Square Feet*

Table 6 *Soil Sampling Strategy for Lots Greater Than 6,500 Square Feet*

Table 7 *Summary of Soil Analytical Results*

Table 8 *Proposed Excavation Details*

Table 9 *Quality Assurance Summary Field Duplicate Samples*

Table 10 *Quality Assurance Summary: Field Blank Samples*

Table 1
NL Industries/Taracorp Superfund Site
Denied Access Properties

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Request Sent:				Telephone Calls	Access Received for:		Soil Cleanup	Notes
							Access Request Sent:					Access Received for:			
				Front	Depth		10/13/2010	1/20/2011	Certified 6/21/2011	Delivery Confirmation 5/20/11	Soil Sampling	Remediation			
1	non-responsive	non-responsive	non-responsive	50	125	6,250	x	x	x		x See notes			NR (CL)	Spoke to non-responsive on 3/7/2011; doesn't own property and knows nothing about it. Identified non-responsive from Yellow Pages search. Number disconnected or no longer in service on 3/7/2011. EWI visited the property on 4/15/2011. No one answered the door, though cars were in driveway. Provided packet in front door on 4/15/2011. Property owner signed for certified letter and access agreement sent in June 2011.
2	non-responsive	non-responsive	non-responsive	30.4	125	3,800	x					x	x	DZ	Access agreement signed by non-responsive on 11/12/2010.
3	non-responsive	No information available on the Madison County - Chief County Assessment website.		---	---	---	x							PD	Access agreement (10/13/2010) returned to sender; unable to forward, no such number. Based on a 1/6/2011 review of information on the Madison County Government website, there are two properties (e.g., stack emission properties) on Allen Street in Venice: (1) non-responsive was remediated to a depth of 12 inches; and (2) non-responsive was sampled and the lead concentrations were below 500 mg/kg. Allen Street resumes approximately 1.2 miles to the southeast in Eagle Park Acres (a remote fill area) where the addresses for the Allen Street properties range from non-responsive to about non-responsive. The Group's records indicate that non-responsive and non-responsive were addressed as remote fill (battery cases) properties. During the 1/20/2011 conference call, the Group requested EPA's approval to delete this property because it does not exist.
4	non-responsive	non-responsive	non-responsive	37.5	150	5,625	x	x				x	x	NFA	Access agreement signed on 2/3/2011 by nonresponsive (daughter, power of attorney) for nonresponsive.
5	non-responsive	non-responsive	non-responsive	37.5	150	5,625	x	x				x	x	NFA	Access agreement signed on 2/3/2011 by nonresponsive (daughter, power of attorney) for nonresponsive.
6	non-responsive	non-responsive	non-responsive	35	125	4,375	x	x	x		x See notes			NR (CL)	Attempted to contact non-responsive 3/7/2011; number disconnected or no longer in service. EWI visited the property during April 2011. Property is boarded up and looks vacant. EWI cannot get to front door due to gate; six-foot fence surrounding property. Property owner signed for certified letter and access agreement sent in June 2011.
7	non-responsive	non-responsive	non-responsive	50	125	6,250	x					x	x	DZ/YD	Access agreement signed by non-responsive on 10/18/2010.

Updated: 12/9/2013

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status						Soil Cleanup	Notes	
							Access Request Sent:				Telephone Calls	Access Received for:			
				Front	Depth		10/13/2010	1/23/2011	Ordered 6/11/2011	Delivery Confirmed 6/20/11		Soil Sampling			Remediation
8	non-responsive	non-responsive	non-responsive	50	125	6,250	x	x			x See notes			DA	Attempted to contact non-responsive) on 3/7/2011 and 3/15/2011; left messages. During the week of 5/9/2011, EWI spoke with homeowner who indicated they do not want testing completed.
9	non-responsive	non-responsive	non-responsive	52	125	6,500	x					x	x	DZ/YD	Access agreement signed by non-responsive, Granite City, IL 62040 non-responsive) on 10/19/2010.
10	non-responsive	non-responsive	non-responsive	50	127.6	6,380	x	x	x	x	x See notes	x	x	YD	Access agreement (10/13/2010) returned to sender; unable to forward. Inquiry made to Madison County Treasurer's Help Desk non-responsive) on 1/6/2011. No forwarding information available for property owners. Access agreement (1/20/2011) returned to sender; no such number, unable to forward. Attempted to contact non-responsive) on 3/7/2011; number disconnected or no longer in service. The Madison County Trustee advised the Group's project coordinator on 3/24/2011 that access is required from the owner; the trustee cannot provide access. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement sent by delivery confirmation in July/August 2011; returned to sender, unable to forward. The Group confirmed with the Madison County Treasurer's Office in October 2011 that the 1731 Chestnut property is in tax delinquent status. The Group received a signed access agreement from the Madison County trustee on 9/19/2013. In September 2013, the Group received a signed access agreement from the Madison County trustee.
11	non-responsive	non-responsive	non-responsive	50	127.6	6,380	x	x			x See notes	x	x	NFA	Attempted to contact non-responsive) on 3/7/2011; no answer. Spoke to Jerry Baugus on 3/15/2011; indicated he donated the property (a duplex) to Granite City several years ago. Spoke to non-responsive) in Mayor Hagenaur's office on 3/16/2011, and she indicated the property transfer to the city was never finalized and that Madison County owns the property. After confirmation was received that the property is owned by the Madison County Trustee, an access agreement was emailed to the Trustee's office on 3/16/2011 and a signed access agreement was received on 3/16/2011.
12	non-responsive	non-responsive	non-responsive	45	125	5,625	x	x	x	x	x See notes			NR (DC)	Unable to locate telephone number for non-responsive) on 3/7/2011. Potential other address: non-responsive. The Madison County Trustee advised the Group's project coordinator on 3/24/2011 that access is required from the owner; the trustee cannot provide EWI visited the property in April 2011. Condemned building, no occupants. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.
13	non-responsive	non-responsive	non-responsive	50	125	6,250	x	x			x See notes	x	x	YD	On 1/3/2011, a telephone call was received from non-responsive, the daughter of the owners (her mother and deceased father) of the non-responsive property in Granite City. She indicated that her father is deceased, her mother is in a nursing care facility, there is a lien on the property by the State of Illinois, and she has power of attorney for the property owners. She will forward a signed access agreement (with the power of attorney) for sampling and remediation. In response to her questions, she was advised that the soil would first be sampled to determine whether soil remediation is necessary. She is also interested, if remediation is necessary, in protecting the large, mature trees (14 bushes, river birch, ginkgo tree, etc.) on the property. She apologized for the delay in responding but was advised that efforts are still ongoing to attempt to obtain access to other properties.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Request Sent:				Telephone Calls	Access Received for:		Soil Cleanup	Notes
				Front	Depth		10/13/2010	1/20/2011	Certified Mail 6/11/2011	Delivery Confirmed 6/28/2011		Access Received for:			
												Soil Sampling	Remediation		
															Attempted to contact non-responsive on 3/7/2011 and 3/15/2011; left messages. Spoke to non- on 3/17/2011; she confirmed that she can also be reached during the day at work non- , that she would like to have the soil tested, and that she will sign and mail the access agreement. On 3/24/2011, the Group's project coordinator received a signed access agreement (for soil sampling and remediation) and power of attorney form from Carol Scott.
14	non-	non-	non-responsive	50	125	6,250	x	x			x See notes	x		DZ/YD	Attempted to contact non-responsive on 3/7/2011 and 3/15/2011; left messages. non- on 3/7/2011 and 3/15/2011; left messages. EWI visited the property on 4/15/2011. No one answered the door, and EWI provided information packet on 4/15/2011. non- signed the access agreement on 5/6/2011.
15	non-	non-	non-responsive	45	125	5,625	x	x			x See notes	x	x	DZ/YD	Attempted to contact non-responsive on 3/7/2011 and 3/15/2011; left messages. EWI visited the property on 4/15/2011. Property owner's children answered door; owners not home. EWI provided informational packet and business card to the children on 4/15/2011. During the week of 5/9/2011, EWI knocked on door; no response. During the week of 5/16/2011, EWI spoke with homeowner. non-responsive signed the access agreement on 5/19/2011.
16	non-	non-	non-responsive non-responsive	45	125	5,625	x					x	x	DZ/YD	Access agreement signed by non-responsive on 10/19/2010.
17	1723 Edison Ave. Granite City	non-	non-responsiv	45	125	5,625	x							DA	Access denied with notation: "I said NO the first time. Will say NO again." Possible telephone number non-; did not call.
18	non-	non-	non-responsive	54	125	6,750	x	x	x		x See notes			NR (CL)	Unable to locate telephone number for non- y (3/7/2011). EWI visited the property on 4/15/2011. No one answered the door. EWI provided Information packet and business card in front door. During the week of 5/9/2011, EWI knocked on door; no response. During the week of 5/16/2011, EWI visited property again, knocked on door and received no response, and left information packet. Property owner signed for certified letter/access agreement sent in 6/2011.
19	non-	non-	non-responsive	33.8	125	4,225	x	x	x	x	x See notes		x	DZ	Access agreement (1/20/2011) returned to sender; not deliverable as addressed, unable to forward. Identified non-responsive from telephone directory search; left messages on 3/7/2011 and 3/15/2011. Spoke to non- (neighbor) on 3/16/2011; property is vacant, unoccupied, and for sale. EWI visited the property in April 2011. House is vacant and for sale. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement sent by delivery confirmation in July/August 2011; returned to sender, unable to forward. Received non- telephone number from Doug Peters, realtor, on 10/5/2011. Spoke with non- on 10/5/2011 and sent a letter and access agreement to him by email (sehupp@gmail.com). A follow-up email was sent to non- on 10/12/2011. On 6/5/2012, the Group sent a letter requesting access to Federal National Mortgage Association, PO Box 650043, Dallas, Texas 75265. On 7/13/2012, the Group sent a letter requesting access to non-responsive non-responsive signed the access agreement on 7/23/2012.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Updated: 12/9/2013

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status						Soil Cleanup	Notes	
							Access Request Sent:				Telephone Calls	Access Received for:			
				Front	Depth		10/13/2010	1/20/2011	Written 10/13/2011	Written 1/20/2011	See notes	Soil Sampling			Remediation
20	non-responsive	non-	non-responsive	56	125	7,000	x	x			x See notes	x	x	DZ	Attempted to contact non-responsive on 3/7/2011 and 3/15/2011; line busy on several attempts. Left message on 3/15/2011. Spoke to non- on 3/16/2011 who indicated that his father (Benny) is deceased and that he would like to have the property sampled and remediated if necessary. A letter confirming access was sent to non- on 3/16/2011.
21		non-028		60	120	7,200	x						x	NFA	Access agreement signed by non-responsive on 10/18/2010.
22		non-		60	120	7,200	x					x	x	NFA	Access agreement signed by non-responsive or non-4) on 10/27/2010.
23		non-4	non-responsive	50	120	6,000	x	x			x See notes			DZ/YD	Access agreement (10/13/2010) returned to sender; unable to forward. Access agreement (1/20/2011) returned to sender; not deliverable as addressed, unable to forward. Attempted to contact non-responsive and non- on 3/7/2011 and 3/15/2011; left messages. Mailed access agreement to potential alternate address for non- on 3/9/2011. On 3/17/2011, the Group's project coordinator spoke to non-. He confirmed that he will sign and provide an access agreement for sampling and remediation and that future correspondence should be mailed to him at his O'Fallon, Illinois, address. The Group's project coordinator mailed a letter to non- on 4/1/2011 to confirm the authorization he provided for soil sampling.
							x	x			x See notes	x			
24		non-		25	118	2,950	x					x	x	DZ/YD	Access agreement signed by non-responsive on 10/20/2010 with notation: "PS at no cost to me."
25		non-		29.5	120	3,540	x					x	x	NFA	Access agreement signed by non-responsive on 11/15/2010.
26	non-	non-		30	120	3,600	x					x	x	PD (C)	Access agreement for non- signed on 10/20/2010 with the following notations: (1) in Group's 10/13/2010 letter where Group states that access to non- property was denied in 1998-2000. non- states: "This is not true! I asked and was denied because no children lived here; yet at 915, children lived there;" (2) non- also granted access to non- (he lives at non- and Group requested access for non- only). When EWI mobilized during the week of 4/11/2011 to collect soil samples, EWI discovered that non- is an abandoned commercial property known as Markuly Starters and Alternators. Because the property was previously used for commercial purposes and has no residential use, soil samples were not collected.
27	non-	non-	non-responsive	55	118	6,490	x				x See notes	x		NFA	Access agreement (10/13/2010) returned to sender; unable to forward. Inquiry made to Madison County Treasurer's Help Desk (telephone 618-692-6260) on 1/6/2011. No forwarding information available for property owners. Unable to locate telephone numbers for non-responsive on 3/7/2011. Attempted to contact non-responsive on 3/7/2011 and 3/15/2011; left messages. The Group's project coordinator was advised by the Madison County Trustee on 3/24/2011 that unless the property owner pays delinquent taxes, court proceedings are expected to occur in early June 2011 and the Trustee expects to be able to sign the access agreement in July 2011. Access agreement signed by the Madison County Trustee on 7/3/2011. In July 2012, the Group learned that Madison County transferred title to non-. The Group sent a letter and access agreement to non- on 7/19/2012. non-, executor of the state of non-, signed the access agreement on 12/21/2012.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status					Soil Cleanup	Notes		
							Access Request Sent:				Telephone Calls			Access Received for:	
				Front	Depth		10/13/2010	1/20/2011	Certified letter 6/11/2011	Delivery Confirmation 9/20/11				Soil Sampling	Remediation
28	non-[redacted]	non-[redacted]	non-[redacted] non-responsive	50	118	5,900	x						x	YD	Access agreement signed on 10/4/2010. When EWI's field crew mobilized to the non-[redacted] property to collect soil samples during the week of 4/11/2011, EWI discovered an abandoned residential property recently occupied by vagrants, extremely overgrown vegetation and large amounts of debris, trash, etc. around the property and warning signs (posted by the City of Madison in 2006) of hazardous, noxious, or unhealthy substances and materials. Due to potential health and safety issues, inability to access the yard areas, and to avoid potential confrontation with the vagrants occupying the property, etc., EWI did not sample this property. In October 2011, the Group's project coordinator spoke to non-[redacted] in Mayor non-[redacted] office who indicated that the property was in a tax-delinquent status, there were ongoing legal proceedings regarding the property, and that the city hopes to demolish the property after the court renders its decision. After this matter was resolved, EWI collected soil samples in June 2013.
29	non-[redacted] Madison	non-[redacted]	non-[redacted] non-responsive	25	120	3,000	x	x	x	x	x See notes			UTL	Access agreement (10/13/2010) returned to sender; unable to forward, moved and left no address. Access agreement (1/20/2011) returned to sender; unable to forward, moved and left no address. Attempted to contact non-responsive [redacted] on 3/7/2011; number disconnected or no longer in service. Mailed access agreement to potential alternate address non-[redacted] (Granite City) on 3/8/2011. EWI visited non-[redacted] during the week of 4/11/2011, received no response, and left an information packet. During week of 5/16/2011, EWI observed information packet in door from last attempt. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement sent by delivery confirmation in July/August 2011; returned as property owner deceased. Re-mailed to occupant on 8/15/2011 and returned as vacant. The Group confirmed with the Madison County Treasurer's Office in October 2011 that the non-[redacted] is in tax delinquent status.
30	non-[redacted] Madison	non-[redacted] non-[redacted]	non-[redacted] non-[redacted] non-responsive	50	120	6,000	x					x	x	DZ/YD	Access agreement signed 12/25/2010. Access agreement signed by non-responsive [redacted] on 1/25/2011.
31	non-[redacted] Madison	non-[redacted] non-[redacted]	non-[redacted] non-responsive non-responsive	25	120	3,000	x				x See notes	x	x	DZ	Access agreement signed by non-[redacted] on 10/26/2010 and 2/1/2011. On 4/6/2011, the Group's project coordinator received a telephone call from non-[redacted] who indicated that she and her husband, non-[redacted], will acquire the property on 4/8/2011. The Group's project coordinator mailed an access agreement to non-[redacted] on 4/6/2011. non-[redacted] signed the access agreement on 4/9/2011.
32	non-[redacted] Granite City	non-[redacted]	non-[redacted] non-responsive	50	120	6,000	x	x			x See notes			DA	On March 7, 2011, the Group's project coordinator spoke to non-[redacted] (telephone non-[redacted]), the owner of the duplex property located at non-responsive [redacted] in Granite City. non-[redacted] acknowledged that the Group's requests for access had been received. She also indicated that she was aware that the soil had previously been sampled at her property and that, based on that data, she and her husband denied access for soil remediation. She indicated that some soil/gravel had previously been removed from the property (decades ago), that she and her husband had sodded the property, and that the previous soil sampling activities were performed after the sod was installed. Despite several attempts to convince non-[redacted] to allow the Group

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status				Telephone Calls	Access Received for:		Soil Cleanup	Notes
				Front	Depth		Access Request Sent:					Soil Sampling	Remediation		
							10/13/2010	1/20/2011	Certified EWI 8/21/2011	Delivery Confirmation 9/20/11					
															to perform soil sampling, she indicated that: (1) she and her husband are of retirement age and are not at all concerned about lead in soil; (2) the house on the property was built in 1885 and she has lived there since 1961 when she was a child; (3) her husband works at Olin where bullets are manufactured and his blood lead level is routinely checked; (4) no children live at the property; (5) no vegetables are grown at the property; and (6) she expects that her property (and others within the block) will ultimately be sold (as soon as she and her husband receive a "good offer") to the neighboring warehouse/truck lot who will demolish the house, level the property, and cover the property with concrete. She indicated several times that they are "not worried" about the current situation, that soil sampling and remediation are "not worth the hassle," and they "don't want to be bothered." She also commented that she thought her antique brick patio was worth more than the house.
33	non-Granite City	non-	non-responsive	37	120	4,440	x	x			x See notes	x		NFA	Spoke to non- (telephone non-) on 3/7/2011 and received access for soil sampling. Confirmed access for soil sampling in a letter sent to non- on 3/10/2011.
34	non-Madison	non-		37.5	127.5	4,781	x	x			x See notes	x		DZ/YD	Spoke to non- (telephone non-) on 3/7/2011 and received access for soil sampling. Confirmed access in a letter sent to non- on 3/10/2011.
35	non-Madison	non-		25	127.5	3,188	x						x	DZ	Access agreement signed on 11/16/2010 and returned by non- non-responsive, telephone (618) non-, cell non-
36	non-Madison	non-		50	127.5	6,375	x	x				x	x	DZ/YD	Unable to locate telephone number (3/9/2011). EWI visited 816 Iowa during the week of 4/11/2011 and spoke to non- advised EWI that he has been out of the country; he signed the access agreement for soil sampling and remediation if necessary.
37	non-Madison	non-		37.5	127.5	4,781	x	x			x See notes	x		YD	Attempted to contact non- (telephone non-) on 3/9/2011; incorrect telephone number. EWI spoke with non- during the week of 4/11/2011 and received a signed access agreement for soil sampling. non- advised EWI that he would likely grant access for remediation if it is necessary.
38	non-Madison	non-	non-respons	37.5	127.5	4,781	x					x	x	NFA	Access agreement signed by non- on 10/23/2010.
39	non-Madison	non-	non-responsive	45	127.5	5,738	x					x	x	YD	Access agreement signed by non- (telephone non-, cell non-) on 10/29/2010.
40	non-Madison	non-	non-responsive	45	127.5	5,738	x	x	x	x				NR (DC)	Unable to locate telephone number (3/9/2011).
							x	x	x					See above	Unable to locate telephone number (3/9/2011). EWI visited non- during the week of 4/11/2011, spoke to non- who indicated that she wanted to speak to someone. EWI provided an information packet, business card. During the week of 5/9/2011, EWI knocked on door; no response. During week of 5/16/2011, EWI knocked on door, received no response, and left information packet. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status					Soil Cleanup	Notes		
							Access Request Sent:				Telephone Calls			Access Received for:	
				Front	Depth		10/13/2010	1/20/2011	Confirmed 8/21/2011	Delivery Confirmed 8/21/2011				Soil Sampling	Remediation
41	non-Madison	non-	non-responsive	25	127.5	3,188	x	x	x	x	x See notes			NR (DC)	Attempted to contact non- (telephone non- on 3/9/2011; disconnected or no longer in service. Attempted to contact non- (telephone non- on 3/9/2011; no answer. Attempted to contact non- (telephone non- on 3/9/2011; disconnected or no longer in service. Based on information provided by the Madison County Treasurer's Office, an access agreement was mailed to non-responsive Collinsville, IL 62234 on 3/24/2011. EWI visited 1314 Iowa during the week of 4/11/2011, received no response, and observed a note on the door from the gas company dated 8/24/2010. During the weeks of 5/9/2011 and 5/16/2011, EWI observed information packet previously left at front door remained at the door. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.
42	non-Granite City	non-46	non-responsive Property owner per Madison County 7/2012: United States Steel Corporation 600 Grant Street Pittsburg, PA 15219	75	127.5	9,563	x	x	x	x				DA	Access agreement (10/13/2010) returned to sender; unable to forward, attempted, not known. Access agreement (1/20/2011) returned to sender; not deliverable as addressed, unable to forward. Based on information provided by the Madison County Treasurer's Office, an access agreement was mailed to non-responsive Granite City, IL 62040, on 3/24/2011. EWI visited 1427 Iowa during the week of 4/11/2011, observed the door kicked in, and no meter on the gas line (possibly vacant house). EWI also visited a law firm located at non- in order to obtain access to non-. No one by the name of non- works there. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011. Based on communications in October 2011, the Group anticipated that an access agreement for soil sampling would be received from US Steel. The Group sent a followup request for access to US Steel on 6/4/2012 and received an "access denied" response from US Steel on 6/5/2012. In 2013, the Group learned that the Madison County government reclassified the former residential property to an industrial use; therefore, soil sampling was not performed.
43	non-Madison	21-non-	non-responsive non-non-	50	115	5,750	x	x	x	x	x See notes	x	x	YD	Attempted to contact non-responsive (telephone non- on 3/9/2011; disconnected or no longer in service. During week of 5/9/2011, EWI knocked on door; no response. During the week of 5/16/2011, EWI knocked on door; no response. Left information packet. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011. The Group received a signed access agreement from Deandra Slaughter in March 2012.
44	non-Granite City	non-	non-responsive	50	125	6,250	x					x	x	DZ/YD	Access agreement signed by non- (telephone non- on 10/19/2010.
45	non-Granite City	non-	non-responsive	32.5	125	4,063	x					x	x	DZ	Access agreement signed by non- (telephone non- non- Pocahontas, IL 62275, on 10/20/2010.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status					Access Received for:		Soil Cleanup	Notes
							Access Request Sent:								
				Front	Depth		10/19/2010	1/20/2011	Correspondence 4/21/2011	Subsequent Correspondence 5/20/11	Telephone Calls	Soil Sampling	Remediation		
46	non-[REDACTED] Madison	non-[REDACTED]	non-responsive [REDACTED] [REDACTED] [REDACTED]	75	127.5	9,563	x					x	x	DZ/YD	Access agreement signed on 10/18/2010. non-[REDACTED] noted on access agreement that access is provided for non-[REDACTED] non-[REDACTED] (The Group did not send letter requesting access for non-[REDACTED] Avenue, Madison.)
47	non-[REDACTED] (see notes for property 46)		non-responsive [REDACTED] [REDACTED]	---	---	---	x					x	x	See above	Access agreement signed on 10/18/2010. non-[REDACTED] noted on access agreement that access is provided for non-[REDACTED] non-[REDACTED] (The Group did not send letter requesting access for non-[REDACTED] Avenue, Madison.)
48	non-[REDACTED] Madison	non-[REDACTED]	Emma Properties LLC 189 Sandy Shore; Granite City, IL 62040	50	120	6,000	x					x	x	DZ	Access agreement signed by non-[REDACTED] non-[REDACTED], Granite City, IL 62040 (telephone non-[REDACTED] on 10/18/2010.
49	non-[REDACTED] Madison	non-[REDACTED]	non-responsiv [REDACTED] Property owner per Madison County 7/2012: Madison County Trustee PO Box 96 Edwardsville, IL 62025	37.5	120	4,500	x	x				x	x	NFA	Unable to locate telephone number (3/9/2011) of property owner. After the Group's project coordinator learned of the tax delinquent status of the property, the Group obtained a signed access agreement for soil sampling from the Madison County Trustee on 3/24/2011. The Group received an access agreement for soil remediation from Mayor Hamm, Madison, in April 2011.
50	non-[REDACTED] Madison	non-[REDACTED]	non-[REDACTED] ----- no non-[REDACTED]	50	120	6,000	x						x	NFA	Access agreement signed on 10/26/2010 by non-[REDACTED] non-[REDACTED] Louis, MO 63125 (telephone non-[REDACTED] non-[REDACTED] noted on access agreement that the address of property is: non-[REDACTED] non-[REDACTED]
51	non-[REDACTED] Madison	non-[REDACTED]	Madison County Trustee PO Box 96 Edwardsville, IL 62025 Telephone: (618) 656-5744	25	120	3,000	x					x	x	YD	Access agreement signed by Josh E. Myer, Agent, PO Box 96, Edwardsville, IL 62025, on 10/21/2010. Requested that all correspondence include parcel ID number.
52	non-[REDACTED] Granite City	non-[REDACTED]	non-responsive [REDACTED] [REDACTED]	50	127.6	6,380	x					x	x	DZ	Access agreement signed 10/19/2010.
53	non-[REDACTED] Granite City	non-[REDACTED]	non-responsive [REDACTED] Property owner per Madison County 7/2012: Federal National Mortgage 1 S. Wacker Drive Chicago, IL 60606	50	127.6	6,380	x	x			x See notes	x	x	NFA	No listed telephone number for non-[REDACTED]. Attempted to contact non-[REDACTED] non-[REDACTED] (telephone non-[REDACTED]) on 3/7/2011; left message. On 3/7/2011, a return call was received from non-[REDACTED] who provided access for soil sampling and remediation if necessary. A letter was sent to non-[REDACTED] on 3/7/2011 to confirm access and to request a signed access agreement.
54	non-[REDACTED] Granite City	non-[REDACTED]	non-responsive [REDACTED] [REDACTED]	50	127.6	6,380	x	x				x	x	NFA	Access agreement signed by non-[REDACTED] on 2/4/2011.
55	non-[REDACTED] Granite City	non-[REDACTED]	non-responsive [REDACTED] [REDACTED]	50	127.6	6,380	x					x	x	YD	Access agreement signed by non-[REDACTED] on 10/18/2010.
56	non-[REDACTED] Granite City	non-[REDACTED]	non-respons [REDACTED] [REDACTED]	33.3	127.6	4,249	x	x	x	x	x See notes			NR (DC)	Unable to locate telephone number (3/9/2011). Contacted directory assistance (3/14/2011); no listing. EWI attempted to contact the property owner on 4/21/2011; no one answered the door (a packet of information was provided at the front door). During the week of 5/9/2011, EWI observed that the door to the residence was open upon arriving; however, homeowner shut door upon walking onto the porch. EWI knocked on door; no response. During week of 5/16/2011, EWI knocked on door; no response. Left information packet. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status				Telephone Calls	Access Received for:		Soil Cleanup	Notes
							Access Request Sent:					Soil Sampling	Remediation		
				Front	Depth		10/13/2010	1/20/2011	Certified 6/11/2011	Delivery Certified 9/20/11					
57	non-Madison	non-	non-responsive	70	148.5	10,395	x	x						DA	Unable to locate telephone number (3/9/2011). EWI contacted non- on 4/15/2011 who indicated she has no interest in lead testing in her yard and refused information packet.
58	non-Madison	non-	respon	44	135	5,940	x	x		x See notes	x	x		YD	Attempted to contact non- (telephone non-) on 3/9/2011 and was advised that he passed away about 2 years ago. Contacted non- niece, non- (telephone non-) on 3/9/2011 who indicated that non- would return the telephone call. Since that time, the Group's project coordinator has spoken on several occasions to non- (telephone non-) in regard to the location of the properties adjacent to Dow Spectrulite Site (also known as Madison Site). In March 2012, Paul Schoen, Esq., Schoen Walton Telken & Foster, LLC, (telephone 618-274-0434 ext. 1142) confirmed that non- is one of his clients related to the Dow Madison Site. On 7/27/2012, Mr. Schoen provided copies of access agreements for non- and non-, which were signed on 7/26/2012 by non-, the property owner.
59	non-Madison	non-	sive non-responsive	62.5	135	8,438	x	x		x See notes	x	x		NFA	The Group received a signed access agreement from the Madison County trustee in March 2012.
60	non-Madison	non-	responsive Property owner per Madison County 7/2012: Madison County Trustee PO Box 96 Edwardsville, IL 62025	50	125	6,250	x	x		x See notes	x	x		YD	Access agreement (10/13/2010) returned to sender; unable to forward, no such number. Access agreement (1/20/2011) mailed to non- non-responsive. Since that time, the Group's project coordinator has spoken on several occasions to non- (telephone non-) in regard to the location of the properties adjacent to Dow Spectrulite Site (also known as Madison Site). The Group received a signed access agreement from the Madison County trustee on 6/6/2012.
61	non-Madison	non-	Madison County Trustee PO Box 96 Edwardsville, IL 62025	---	---	---	x	x		x See notes	x	x		NFA	Access agreement signed by non- (telephone non-) on 10/18/2010.
62	non-Madison	non-	non-responsive non-	50	125	6,250	x					x		NFA	Access agreement signed by non- (telephone non-) on 10/21/2010.
63	non-Granite City	non-	responsive non-	50	127.6	6,380	x					x	x	DZ	Notice received in November 2010 from Bank of America Home Loans, PO Box 5170, Simi Valley, CA 93062-5170, on 11/22/2010 stating: Your request has been forwarded to the Property Preservation Department for further research; you will be notified in writing once the research is complete. Based upon a 3/10/2011 telephone conversation with the Bank of America Home Loans Property Preservation Department (telephone 866-515-9759), they indicated that the property is occupied and that they could not help with access. Attempted to contact non- and non- (telephone non-) identified through Google White Pages search) on 3/20/2011; number disconnected or no longer in service. EWI attempted to contact the property owner on 4/21/2011; no one answered the door (a packet of information was provided at the front door). During the week of 5/9/2011, EWI knocked on door; no response (car was visible in driveway). During week of 5/16/2011, EWI knocked on door, received no response, and left information packet. House appears to be vacant. Recipients (American Housing Trust IV and National Mortgage Company) signed for certified letters and access agreements sent in June 2011.
64	non-Granite City	non-	American Housing Trust IV 1731 Olive St. Granite City, IL 62040 Natl. Mortgage Co., Nancy Whalan 2059 Northlake Parkway Tucker, GA 30084-5321	33.3	127.6	4,249	x		x	x See notes				NR (CL)	

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status					Soil Cleanup	Notes		
				Front	Depth		Access Request Sent:				Telephone Calls			Access Received for:	
							10/13/2010	1/20/2011	Delivered 4/21/2011	Delivery Status 9/20/11				Soil Sampling	Remediation
65	non-Granite City	non-	non-responsive non-responsive responsive	25	127.6	3,190	x	x			x See notes	x		DZ/YD	Access agreement (10/13/2010) returned to sender; unable to forward. On 1/25/2011, the Group's project coordinator received a telephone call from non- (telephone: non-) who indicated: (1) the property owners, non- and non-, are both deceased; (2) the property was not willed to anyone when the non- died; (3) the property has been vacant for years; (4) he was calling for his girlfriend, non-, who is the niece of Mr. and Mrs. non- and who collects mail received at the property; and (5) he and non- do not object to soil sampling but do not own property. Per Madison County Treasurers Office (telephone: 618-692-6260) on 1/27/2011: (1) the owners of the property are listed as non-responsive; and (2) there was no tax bill for the property in 2008 (exemption for seniors), and taxes have not been paid in 2009 and 2010. The Group subsequently received a 1/26/2011 letter from non-. The Group's project coordinator confirmed by telephone with non- on 2/18/2011 that he and non- did not object to soil sampling. The Group sent a letter to non- on 3/10/2011 to confirm the Group's plans for collecting soil samples. The Group mailed a subsequent letter to non- on 4/1/2011 in regard to the soil sampling schedule. The letter sent to non- was returned, but the letter sent to non- was not returned. Access agreement (10/13/2010) returned to sender; unable to forward. Access agreement (1/20/2011) returned to sender; vacant, unable to forward. After the Group learned that non- acquired the property in October 2013, the Group sent a letter to non- in October 2013 to request access.
66	non-Granite City	non-	responsive	50	127.6	6,380	x	x	x	x	x See notes			NR (DC)	Attempted to contact non- (telephone non-) on 3/10/2011 and 3/15/2011; left messages. EWI attempted to contact the property owner on 4/21/2011; no one answered the door (a packet of information was provided at the front door). During the week of 5/9/2011, EWI knocked on door; no response. During week of 5/16/2011, EWI knocked on door; no response. Left information packet. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.
67	non-Madison	non-	non-responsive	Irregular Property Size		9,090	x	x			x See notes	x		NFA	Spoke to non- (telephone non-) on 3/10/2011, and she provided access for soil sampling (she also indicated that she likely would not provide access for remediation, regardless of the results of soil tests. The Group's project coordinator sent a letter to non- on 3/10/2011 to confirm access.
68	non-Madison	non-	non-	50	150	7,500	x					x		NFA	Access agreement signed by non- (telephone non-) on 10/27/2010.
69	non-Madison	non-	non-responsive non-	75	150	11,250	x	x			x See notes			DA	Spoke to non- (telephone non-). He was employed by NL Industries and later retired from Taracorp and is not interested in having his soil tested.
70	non-Madison	non-	non-responsive	50	150	7,500	x	x			x See notes	x	x	DZ/YD	Unlisted telephone number; unable to locate telephone contact information for Maurice Cooper. EWI visited nonresponsive during the week of 4/11/2011, received no response at the front door, and provided information packet. EWI observed that the packet had been removed on 4/15/2011. The Group's project coordinator spoke to non- on 4/25/2011; she provided access for soil sampling and remediation and indicated that a signed access agreement would be mailed. The Group's project coordinator received a signed access agreement on 4/30/2011.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status				Access Received for:		Soil Cleanup	Notes	
							Access Request Sent:								
				Front	Depth		10/13/2010	1/20/2011	Certified 2/21/2011	Delivery Certified 3/28/11	Telephone Calls	Soil Sampling			Remediation
71	non-Madison	non-5	non-responsive	50	150	7,500	x	x			x See notes			DA	Attempted to contact non- (telephone non- on 3/10/2011 and 3/15/2011; left messages. Based on information provided by the Madison County Treasurer's Office, an access agreement was mailed to non-responsive on 3/24/2011. EWI visited non- during the week of 4/11/2011 and spoke with the property owner. EWI provided a packet of information, and the property owner requested additional information and time for review. During the week of 5/9/2011, EWI spoke to homeowner who indicated she does not want testing completed.
72	non-Madison	non-6	non-responsive	25	150	3,750	x					x	x	NFA	Access agreement signed by non- (telephone non- on 10/26/2010.
73	non-Madison	non-2	non-responsive	23	150	3,450	x	x	x	x	x See notes			NR (DC)	Unsuccessful attempts to contact non- (telephone non-) on 3/10/2011 and 3/15/2011; left messages. During the week of 5/9/2011, EWI knocked on door; no response. During week of 5/16/2011, EWI knocked on door; no response. Left information packet. Certified letter and access agreement mailed in June 2011, returned to sender, unclaimed, and unable to forward. Letter and access agreement delivered to property by delivery confirmation in July/August 2011.
74	non-Granite City	non-8	non-responsive	50	127.6	6,380	x					x		DZ/YD	Access agreement signed on 10/18/2010.
75	non-Granite City	non-	non-responsive (call after 11/3/2010 or contact by US mail)	50	127.6	6,380	x					x	x	YD	Access agreement signed by non-responsive on 10/18/2010.
76	non-Granite City	non-910	non-respons	75	116.5	8,738	x	x						NFA	Access agreement (10/13/2010) returned to sender; unable to forward. Note on envelope suggests non- no longer resides at non-. Access agreement (1/20/2011) returned to sender; not deliverable as addressed, unable to forward.
			non-responsive Property owner per Madison County				x					x	x		Access agreement signed by non- non-responsive IL (telephone non- on 10/24/2010.
77	non-Granite City	non-3	non-responsive	40	125	5,000	x	x			x See notes			DZ/YD	Spoke to non- (telephone non- on 3/10/2011, and he confirmed that he previously owned the non- property but had sold it to non- but did not know her telephone number.
			non-responsiv				x	x			x See notes	x	x		An unsuccessful attempt was made on 3/10/2011 to contact non- (telephone non-); left message on 3/15/2011. EWI spoke to non- during the week of 4/11/2011, and she signed an access agreement for soil sampling and remediation. EWI spoke with non- during April 2011 and she requested that the field crew contact her one day in advance so she can contain her dog and requested that the crew stay away from her flower garden.

Table 1_NL Industries Site Institutional Controls Summary, Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status						Soil Cleanup	Notes	
				Front	Depth		Access Request Sent:				Telephone Calls	Access Received for:			
							10/15/2010	1/20/2011	Completed 6/31/2011	Delivered 6/30/2011		Soil Sampling			Remediation
78	non-Granite City	non-	non-responsiv	40	125	5,000	x	x			x See notes	x		DZ/YD	Unsuccessful attempts on 3/10/2011 and 3/15/2011 to contact non- (telephone non-, listed as property resident on Google White Pages search); calls not answered. EWI visited the property on 4/15/2011. No one answered the door and EWI provided the information packet and business card in front door. During the week of 5/9/2011, EWI spoke with non-; non- subsequently signed access agreement on 5/10/2011.
79	non-Granite City	non-	non-responsiv	50	60	3,000	x	x			x See notes	x	x	YD	Unsuccessful attempts on 3/10/2011 and 3/15/2011 to contact non- (telephone non-, listed as property resident on Google White Pages search); calls not answered. Based upon information provided by the Madison County Treasurer's Office, an access agreement was mailed to non-responsive on 3/24/2011. EWI spoke with the property maintenance man on 4/21/2011; he stated he would deliver the packet to the owner. non-responsive signed the access agreement on 4/22/2011.
			e	50	125	6,250									
80	non-Granite City	non-1001	non-responsiv non-responsive	65	50	3,250	x	x				x	x	See above	Access agreement signed for non- on 4/22/2011.
81	non-Madison	non-19	non-respon sive	50	127.5	6,375	x						x	DZ	Access agreement signed on 10/19/2010.
82	non-Madison	non-23	non-responsiv e non- non-	25	120	3,000	x	x			x See notes	x	x	NFA	Spoke to non- (telephone non- on 3/10/2011, and she provided access for soil sampling and requested a telephone call to confirm the schedule for soil sampling. The Group's project coordinator mailed a letter on 3/10/2011 to confirm access. On 3/11/2011, the Group's project coordinator received a signed access agreement for soil sampling and soil remediation if necessary.
83	non-Madison	non-24	non-responsiv non- non-	25	127.5	3,188	x	x						DA	Unable to locate telephone number (3/10/2011). EWI visited non- during the week of 4/11/2011. spoke with the renter, and provided an informational packet. The renter will speak to her parents regarding access. During the week of 5/9/2011, EWI knocked on door; no response (front door was open). During week of 5/16/2011, EWI received a signed access agreement from non-responsive, but the owner later retracted authorization.

Table 1_NL Industries Site Institutional Controls Summary. Access Status

Denied Access Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status							Soil Cleanup	Notes
				Front	Depth		Access Request Sent:				Telephone Calls	Access Received for:			
							10/13/2010	1/20/2011	Callused 6/11/2011	Delivery Confirmed 9/20/11		Soil Sampling	Remediation		
84	non- Madison	non-08	non- non- non-	50	127.5	6,375	x	x			x See notes	x	x	DZ/YD	Unable to identify correct telephone number. Unsuccessful efforts on 3/10/2011 to contact property owner; left message on 3/10/2011 (telephone non- but confirmed by telephone call on 3/15/2011 (to non- see denied access property #53) that this is not the correct telephone number and that non- is not the property owner. EWI visited non- during the week of 4/11/2011, observed a car in the driveway, but received no response at the door. EWI provided an informational packet in the front door and noted that the packet had been removed on 4/15/2011. non- signed the access agreement on 4/20/2011.

Notes:

1. The property owner names, addresses, tax parcel identification numbers, & lot sizes were obtained from the Madison County - Chief County Assessment website (<http://reweb1.co.madison.il.us/Forms/Search.aspx>).

Soil Cleanup Key:

DA = Denied access
 DZ = Drip zone remediation
 DZ/YD = Drip zone/yard remediation.
 NFA = No further action
 NR = No response

NR(CL) = No response to certified letter
 NR(DC) = No response to delivery confirmation
 O = Other
 P = Pending
 PD = Proposed deletion

PD(C) = Proposed deletion (commercial property)
 SS = Soil sampling to be performed at a later date
 UTL = Unable to locate
 X = Access received
 YD = Yard remediation

Table 2
NL Industries/Taracorp Superfund Site
SEP Properties
Property Locations, Property Owner Mailing Addresses, Property Lot Sizes, and Access Status

SEP Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (In feet)		Lot Size (Square Feet)	Access Status				Soil Cleanup	Notes
				Front	Depth		Access Request Sent:		Access Received for:			
						10/13/2010	1/20/2011	Soil Sampling	Remediation			
5	non- Madison	non-	non-responsive	25	128	3,188	x		x	x	DZ	Access agreement signed by non- and non- (telephone non-) on 10/22/2010.
8	non- Granite City	non-		40	125	5,000	x		x	x	DZ	Access agreement signed by non- (telephone non- on 10/19/2010.
15	non- Granite City	non-		50	125	6,250	x	x	x	x	DZ/YD	Access agreement (10/13/2010) returned to sender; forward time expired. Access agreement sent on 12/18/2010 and 1/20/2011 to non-non-responsive. Access agreement signed by non- on 1/31/2011.
29	non- Granite City	non-		42.5	125	5,313	x		x	x	DZ	Access agreement signed by non-responsive on 10/19/2010.
39	non- Granite City	221 non-	non-responsive	42.5	125	5,313	x sent 10/28/2010	x	x		DZ	Spoke to non- on 3/11/2011. He provided access to non- no, a duplex property, for soil sampling. The Group's project coordinator sent a letter on 3/11/2011 to confirm access for soil sampling.
43	non- Granite City	non-	non- respon sive	36.5	125	4,563	x		x		DZ	Access agreement signed on 10/18/2010 by non-responsive non- (telephone non-responsive).
52	non- non	non-12	non-responsive	50	125	6,250	x		x	x	DZ/YD	Access agreement signed by non- (telephone non-), non-responsive on 10/31/2010.
72	non- Granite City	non-	non-responsive	50	125	6,250	x	x		x	DZ	The Group's project coordinator spoke to non- on 3/11/2011. During that conversation, non- agreed to provide access for soil sampling and remediation if necessary and acknowledged that he would return the signed access agreement.
74	non- Granite City	non-3	non-responsive	50	125	6,250	x	x	x		NFA	Spoke to non- on 3/11/2011. She provided access for soil sampling. The Group's project coordinator sent a letter on 3/11/2011 to confirm access for soil sampling. The Group's project coordinator received a signed access agreement from non- on 11/3/2011.

Notes:

1. The property owner names, addresses, tax parcel identification numbers, and lot sizes were obtained from the Madison County - Chief County Assessment website (<http://reweb1.co.madison.il.us/Forms/Search.aspx>).

Soil Cleanup Key:

DA = Denied access
DZ = Drip zone remediation
DZ/YD = Drip zone/yard remediation.
NFA = No further action
NR = No response

NR(CL) = No response to certified letter
NR(DC) = No response to delivery confirmation
O = Other
P = Pending
PD = Proposed deletion

PD(C) = Proposed deletion (commercial property)
SS = Soil sampling to be performed at a later date
UTL = Unable to locate
X = Access received
YD = Yard remediation

Table 3
NL Industries/Taracorp Superfund Site
Additional Property
Property Locations, Property Owner Mailing Addresses, Property Lot Sizes, and Access Status

Additional Property Number	Address	Tax Parcel ID	Property Owner/Address	Lot Dimensions (in feet)		Lot Size (Square Feet)	Access Status				Soil Cleanup	Notes
				Front	Depth		Access Request Sent:		Access Received for:			
							10/13/2010	1/20/2011	Soil Sampling	Remediation		
1	non- Madison	non-	non-responsive	60	120	7,200				x	NFA	Access agreement signed by non-responsive on 4/25/2011.

Notes:
1. The property owner names, addresses, tax parcel identification numbers, and lot sizes were obtained from the Madison County - Chief County Assessment website (<http://reweb1.co.madison.il.us/Forms/Search.aspx>).

Soil Cleanup Key:

DA = Denied access	NR(CL) = No response to certified letter	PD(C) = Proposed deletion (commercial property)
DZ = Drip zone remediation	NR(DC) = No response to delivery confirmation	SS = Soil sampling to be performed at a later date
DZ/YD = Drip zone/yard remediation.	O = Other	UTL = Unable to locate
NFA = No further action	P = Pending	X = Access received
NR = No response	PD = Proposed deletion	YD = Yard remediation

Table 4
NL Industries/Taracorp Superfund Site
Summary of Access Agreement Status

Property	Address	Soil Sampling Only	Soil Remediation	Soil Sampling and Remediation	Denied Access	No Response	Comments
DAP 1	non-[REDACTED]					X	
DAP 2	non-[REDACTED]			X			
DAP 4	non-responsive [REDACTED]			X			
DAP 5	[REDACTED]			X			
DAP 6	[REDACTED]					X	
DAP 7	[REDACTED]			X			
DAP 8	[REDACTED]				X		Denied access verbally to EWI during the week of 5/9/2011.
DAP 9	[REDACTED]			X			
DAP 10	[REDACTED]			X			
DAP 11	[REDACTED]			X			
DAP 12	[REDACTED]					X	
DAP 13	[REDACTED]			X			
DAP 14	[REDACTED]	X					
DAP 15	[REDACTED]			X			
DAP 16	[REDACTED]			X			
DAP 17	non-[REDACTED]				X		
DAP 18	non-[REDACTED]					X	
DAP 19	responsive [REDACTED]		X				
DAP 20	[REDACTED]			X			
DAP 21	[REDACTED]		X				
DAP 22	[REDACTED]			X			
DAP 23	[REDACTED]	X					
DAP 24	[REDACTED]			X			
DAP 25	non-[REDACTED]			X			
DAP 26	non-[REDACTED]			X			Commercial property; no soil sampling performed.
DAP 27	responsive [REDACTED]	X					
DAP 28	[REDACTED]		X				
DAP 29	[REDACTED]					X	
DAP 30	[REDACTED]			X			
DAP 31	[REDACTED]			X			

Table 4
NL Industries/Taracorp Superfund Site
Summary of Access Agreement Status

Property	Address	Soil Sampling Only	Soil Remediation	Soil Sampling and Remediation	Denied Access	No Response	Comments
DAP 32	non-responsive				X		Owner verbally denied access on 3/07/2011.
DAP 33		X					
DAP 34		X					
DAP 35			X				
DAP 36				X			
DAP 37		X					
DAP 38				X			
DAP 39				X			
DAP 40						X	
DAP 41						X	
DAP 42	1427 Iowa St. Granite City, IL 62040				X		US Steel denied access. Because the former residential property is now classified by the Madison County government as an industrial property, soil sampling was not performed.
DAP 43	non-responsive			X			
DAP 44				X			
DAP 45				X			
DAP 46				X			
DAP 47				X			
DAP 48				X			
DAP 49				X			
DAP 50			X				
DAP 51				X			
DAP 52				X			
DAP 53				X			
DAP 54				X			
DAP 55				X			
DAP 56						X	
DAP 57	Ave. non-responsive				X		Owner verbally denied access on 4/15/2011.
DAP 58	responsiv			X			
DAP 59	e			X			
DAP 60	0			X			

Table 4
NL Industries/Taracorp Superfund Site
Summary of Access Agreement Status

Property	Address	Soil Sampling Only	Soil Remediation	Soil Sampling and Remediation	Denied Access	No Response	Comments
DAP 61	non-responsive			X			
DAP 62			X				
DAP 63				X			
DAP 64						X	
DAP 65		X					
DAP 66						X	
DAP 67		X					
DAP 68		X					
DAP 69					X		
DAP 70				X			
DAP 71					X		Owner denied access verbally to EWI during the week of 5/9/2011.
DAP 72				X			
DAP 73						X	
DAP 74		X					
DAP 75				X			
DAP 76				X			
DAP 77	non-responsive			X			
DAP 78		X					
DAP 79				X			
DAP 80				X			
DAP 81			X				
DAP 82				X			
DAP 83					X		Owner denied access for soil sampling after signing access agreement.
DAP 84				X			
SEPP 5				X			
SEPP 8				X			
SEPP 15				X			
SEPP 29				X			
SEPP 39		X					
SEPP 43		X					

Table 4
NL Industries/Taracorp Superfund Site
Summary of Access Agreement Status

Property	Address	Soil Sampling Only	Soil Remediation	Soil Sampling and Remediation	Denied Access	No Response	Comments
SEPP 52	non-responsive			X			
SEPP 72			X				
SEPP 74		X					
AP 1			X				
TOTALS		14	9	51	8	11	

Table 5
NL Industries/Taracorp Superfund Site
Soil Sampling Strategy For Lots Less Than 6,500 Square Feet

Sample Number	Location	Sample Depth	Sampling Protocol
1	Front yard	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the front yard. Deviations from this sampling plan were noted on the analytical table.
2		3 – 6 inches for each aliquot	
3		6 – 12 inches for each aliquot	
4	Back yard	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the front yard. Deviations from this sampling plan were noted on the analytical table.
5		3 – 6 inches for each aliquot	
6		6 – 12 inches for each aliquot	
7	Side yard #1 (if property has a side yard of substantial size)	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the side yard. Deviations from this sampling plan were noted on the analytical table.
8		3 – 6 inches for each aliquot	
9		6 – 12 inches for each aliquot	
10	Side yard #2 (if property has a side yard of substantial size)	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the side yard. Deviations from this sampling plan were noted on the analytical table.
11		3 – 6 inches for each aliquot	
12		6 – 12 inches for each aliquot	

Table 5
NL Industries/Taracorp Superfund Site
Soil Sampling Strategy For Lots Less Than 6,500 Square Feet

Sample Number	Location	Sample Depth	Sampling Protocol
13	Bare play area, if present	0 – 3 inches	One grab sample (located approximately in the center of the bare play area) was collected for analysis. Deviations from this sampling plan were noted on the analytical table.
14		3 – 6 inches	
15		6 – 12 inches	
16	Vegetable garden, if present	0 – 3 inches	One grab sample (located near the center of the garden) was collected for analysis. Deviations from this sampling plan were noted on the analytical table.
17		3 – 6 inches	
18		6 – 12 inches	
19	Drip zone	0 – 3 inches for each aliquot	Four sample aliquots (one aliquot from the mid-point of the drip zone on each side of the house) was collected and combined to form one composite sample for analysis. Deviations from this sampling plan were noted on the analytical table.
20		3 – 6 inches for each aliquot	
21		6 – 12 inches for each aliquot	

Note: The yard soil sample aliquots (sample numbers 1 – 18, above) were not collected from areas that are in close proximity to any painted surfaces or other potential sources of lead.

Modified from ICWP Table 11.

Table 6
NL Industries/Taracorp Superfund Site
Soil Sampling Strategy for Lots Greater Than 6,500 Square Feet

Sample Number	Location	Sample Depth	Sampling Protocol
1	Quadrant 1	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the quadrant. Deviations from this sampling plan were noted on the analytical table.
2		3 – 6 inches for each aliquot	
3		6 – 12 inches for each aliquot	
4	Quadrant 2	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the quadrant. Deviations from this sampling plan were noted on the analytical table.
5		3 – 6 inches for each aliquot	
6		6 – 12 inches for each aliquot	
7	Quadrant 3	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the quadrant. Deviations from this sampling plan were noted on the analytical table.
8		3 – 6 inches for each aliquot	
9		6 – 12 inches for each aliquot	
10	Quadrant 4	0 – 3 inches for each aliquot	Five sample aliquots (each as equally spaced as possible within the area being sampled) were collected and combined to form one composite sample for analysis. The goal was to obtain five equally spaced aliquots within the quadrant. Deviations from this sampling plan were noted on the analytical table.
11		3 – 6 inches for each aliquot	
12		6 – 12 inches for each aliquot	

Table 6
NL Industries/Taracorp Superfund Site
Soil Sampling Strategy for Lots Greater Than 6,500 Square Feet

Sample Number	Location	Sample Depth	Sampling Protocol
13	Bare play area, if present	0 – 3 inches	One grab sample (located approximately in the center of the bare play area) was collected for analysis. Deviations from this sampling plan were noted on the analytical table.
14		3 – 6 inches	
15		6 – 12 inches	
16	Vegetable garden, if present	0 – 3 inches	One grab sample (located near the center of the garden) was collected for analysis. Deviations from this sampling plan were noted on the analytical table.
17		3 – 6 inches	
18		6 – 12 inches	
19	Drip zone	0 – 3 inches for each aliquot	Four sample aliquots (one aliquot from the mid-point of the drip zone on each side of the house) was collected and combined to form one composite sample for analysis. Deviations from this sampling plan were noted on the analytical table.
20		3 – 6 inches for each aliquot	
21		6 – 12 inches for each aliquot	

Note: The yard soil sample aliquots (sample numbers 1 – 18, above) were not collected from areas that are in close proximity to any painted surfaces or other potential sources of lead.

Modified from the ICWP Table 12.

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	n non-	1	4/11/2011	9:26	292	A 2-point composite drip zone sample was collected rather than a 4-point composite because the north, south, and east sides of the residence were surrounded by a concrete pad. Drip zone samples were collected from either side of the front porch on the west side of the residence. Field blank (RP- non-) was collected following side yard sample collection and decontamination process of stainless steel split spoon sampler.
	o respon non-	1	4/11/2011	9:26	185	
	n- sive non-	1	4/11/2011	9:26	89.1	
	re non- sive non-	1	4/11/2011	9:46	500	
	o non- sive non-	1	4/11/2011	9:46	324	
	ns non- sive non-	1	4/11/2011	9:46	442	
	iv non- sive non-	1	4/11/2011	10:12	169	
	e non- sive non-	1	4/11/2011	10:12	93.7	
	non- sive non-	1	4/11/2011	10:12	93.4	
	non- sive non-	1	4/11/2011	13:05	494	
	non- sive non-	1	4/11/2011	13:05	240	
	non- sive non-	1	4/11/2011	13:05	110	
non- Madison, IL	sive non-	1	4/11/2011	11:12	331	The north side of the residence is comprised of a small strip of grass. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. A 2-point composite sample was collected from the drip zone instead of a 4-point composite because of the presence of a concrete pad along the south side of the residence. Duplicate sample collected in drip zone.
	non- sive non-	1	4/11/2011	11:12	149	
	non- sive non-	1	4/11/2011	11:12	82.7	
	nsive non-	1	4/11/2011	11:00	249	
	non- sive non-	1	4/11/2011	11:00	184	
	n non- sive non-	1	4/11/2011	11:00	190	
	o non- sive non-	1	4/11/2011	11:32	185	
	n non- sive non-	1	4/11/2011	11:32	109	
	s non- sive non-	1	4/11/2011	11:32	79	
	p non- sive non-	1	4/11/2011	11:35	354	
	on non- sive non-	1	4/11/2011	11:35	231	
	n non- sive non-	1	4/11/2011	11:35	123	
	sive non- sive non-	1	4/11/2011	11:35	63.1	
	non- sive non-	1	4/11/2011	11:35	63.1	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non-Madison, IL	n non	1	4/12/2011	10:42	247	The drip zone samples for this property were collected on 4/11/11. Conditions at the site required the sampling team to return to the site on 4/12/11 to complete sampling of the yard.
	o responsiv non	1	4/12/2011	10:42	197	
	n-e	1	4/12/2011	10:42	225	
	re non	1	4/12/2011	10:42	225	
	s responsiv non	1	4/12/2011	11:22	137	
	p e responsiv non	1	4/12/2011	11:22	189	
	n non	1	4/12/2011	11:22	171	
	si responsiv non	1	4/12/2011	11:39	296	
	e responsiv non	1	4/12/2011	11:39	212	
	e responsiv non	1	4/12/2011	11:39	344	
	e responsiv non	1	4/12/2011	11:00	261	
	e responsiv non	1	4/12/2011	11:00	187	
	e responsiv non	1	4/12/2011	11:00	289	
	e responsiv non	1	4/11/2011	15:22	315	
	n non non	1	4/11/2011	15:22	121	
	e responsiv non	1	4/11/2011	15:22	162	
non-Madison, IL	e responsiv res non	1	4/12/2011	8:51	384	A 3-point composite drip zone sample was collected rather than a 4-point composite because a concrete driveway runs along the west side of the home. Field blank (RP-1615 Elizabeth-FB) was collected following decontamination process of stainless steel split spoon sampler used for quadrant one sampling. Duplicate sample collected in drip zone.
	e responsiv siv non	1	4/12/2011	8:51	192	
	e responsiv non	1	4/12/2011	8:51	104	
	ve responsiv non	1	4/12/2011	9:30	261	
	e responsiv non	1	4/12/2011	9:30	261	
	e responsiv non	1	4/12/2011	9:30	327	
	e responsiv non	1	4/12/2011	9:13	312	
	e responsiv non	1	4/12/2011	9:13	441	
	e responsiv non	1	4/12/2011	9:13	299	
	e responsiv non	1	4/12/2011	8:40	266	
	e responsiv non	1	4/12/2011	8:40	187	
	n non	1	4/12/2011	8:40	405	
	o responsiv non	1	4/12/2011	8:40	405	
	n-e responsiv non	1	4/12/2011	9:50	386	
	s responsiv non	1	4/12/2011	9:50	418	
	p e responsiv non	1	4/12/2011	9:50	164	
	n non	1	4/12/2011	9:50	291	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	n non-	1	4/12/2011	13:32	238	Duplicate sample collected in front yard.
	o respon non-n	1	4/12/2011	13:32	295	
	n sive re non-	1	4/12/2011	13:32	143	
	onsiv s respon non-	1	4/12/2011	13:40	521	
	p sive o non-	1	4/12/2011	13:40	378	
	n sive non-	1	4/12/2011	13:40	279	
	st sive non-	1	4/12/2011	13:40	320	
	v non sive e respon non-	1	4/12/2011	13:50	371	
	sive non-	1	4/12/2011	13:50	321	
	sive non-	1	4/12/2011	13:50	240	
	sive non-	1	4/12/2011	14:15	412	
	nsive non-	1	4/12/2011	14:15	305	
	sive non-	1	4/12/2011	14:15	141	
	sive n non-	1	4/12/2011	14:25	647	
	o sive non-	1	4/12/2011	14:25	226	
	n sive re n ho	1	4/12/2011	14:25	343	
non- Madison, IL	sive p non	1	4/12/2011	15:43	211	The north side of the home is an asphalt walkway that runs along the northern property boundary, therefore no side yard or drip zone exists on the north side of this property. A concrete sidewalk runs along the south side of the home and a concrete patio is located on the east side of the home. Therefore, a 2-point composite drip zone sample was collected from the west side of the home. Duplicate sample collected in side yard.
	o non	1	4/12/2011	15:43	249	
	n sive non-	1	4/12/2011	15:43	165	
	st sive non-	1	4/12/2011	15:38	287	
	e sive non-	1	4/12/2011	15:38	375	
	sive non-	1	4/12/2011	15:38	260	
	nsive non-	1	4/12/2011	16:00	466	
	nsive non-	1	4/12/2011	16:00	325	
	sive non-	1	4/12/2011	16:00	131	
	n non sive	1	4/12/2011	16:12	181	
	o respon non-	1	4/12/2011	16:12	138	
	n sive non-	1	4/12/2011	16:12	149	
	nsive s respon non-	1	4/12/2011	16:12	103	
	sive respon sive					

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	n non-	1	4/13/2011	9:12	446	The home is located on the north property boundary, so no north side yard exists. A 3-point composite drip zone sample was collected rather than a 4-point composite because an asphalt sidewalk was located along the south side of the residence. Field blank non- was collected following front yard sampling and decontamination process of stainless steel split spoon sampler.
	o respon	1	4/13/2011	9:12	438	
	n sive	1	4/13/2011	9:12	333	
	renon	1	4/13/2011	9:04	577	
	s respon	1	4/13/2011	9:04	521	
	p sive	1	4/13/2011	9:04	893	
	o non-	1	4/13/2011	9:38	175	
	n sive	1	4/13/2011	9:38	280	
	si non-	1	4/13/2011	9:38	110	
	ve non-	1	4/13/2011	9:46	421	
	e respon	1	4/13/2011	9:46	1150	
	sive	1	4/13/2011	9:46	326	
	non-	1	4/13/2011	13:05	460	A 3-point composite drip zone was collected rather than a 4-point composite because a concrete sidewalk was located along the north side of the residence. Duplicate sample collected in quadrant four.
non- Madison, IL	non-	1	4/13/2011	13:05	408	
	nsive	1	4/13/2011	13:05	319	
	non-	1	4/13/2011	12:55	4.1	
	nsive	1	4/13/2011	12:55	339	
	non-	1	4/13/2011	12:55	294	
	nsive	1	4/13/2011	13:40	291	
	non-	1	4/13/2011	13:40	288	
	nsive	1	4/13/2011	13:40	316	
	non-	1	4/13/2011	13:29	301	
	nsive	1	4/13/2011	13:29	393	
	non-	1	4/13/2011	13:29	242	
	nsive	1	4/13/2011	13:29	319	
	non-	1	4/13/2011	13:54	804	
	nsive	1	4/13/2011	13:54	218	
	non-	1	4/13/2011	13:54	244	
	nsive	1	4/13/2011	13:54	244	
	non-	1	4/13/2011	13:54	244	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	n non- no no	1	4/14/2011	8:39	69	Two residences occupy this property. A 6-point composite drip zone sample was collected from both residences rather than an 8-point composite because the south side of the primary residence was comprised of a sidewalk and the secondary residence was located along the south property boundary. Field blank n non- FB) was collected following quadrant two safety decontamination process of stainless steel split spoon sampler. Duplicate sample collected in quadrant three.
	non- n-	1	4/14/2011	8:39	63.7	
	responsive fes	1	4/14/2011	8:39	385	
	non- no	1	4/14/2011	8:25	396	
	responsive	1	4/14/2011	8:25	239	
	non- fes	1	4/14/2011	8:25	171	
	responsive pon	1	4/14/2011	9:13	160	
	responsive siv	1	4/14/2011	9:13	355	
	non- e	1	4/14/2011	9:13	547	
	responsive	1	4/14/2011	9:13	583	
	non-	1	4/14/2011	8:56	438	
	responsive	1	4/14/2011	8:56	355	
	non-	1	4/14/2011	8:56	378	
	responsive	1	4/14/2011	9:36	548	
	non-	1	4/14/2011	9:36	354	
	responsive	1	4/14/2011	9:36	345	
	non-					
non- Madison, IL	responsive n ho on-	1	4/14/2011	11:10	245	A 3-point composite drip zone sample was collected rather than a 4-point composite because a concrete sidewalk was located along the south side of the home. Since the home is located along the north property boundary, no north side yard exists.
	o n-	1	4/14/2011	11:10	222	
	n fe non	1	4/14/2011	11:10	122	
	- hon	1	4/14/2011	10:43	329	
	r sive	1	4/14/2011	10:43	68.3	
	r non	1	4/14/2011	10:43	62.7	
	e siv	1	4/14/2011	11:42	1680	
	s hon	1	4/14/2011	11:42	344	
	p sive	1	4/14/2011	11:42	987	
	phon	1	4/14/2011	11:35	758	
	o ive	1	4/14/2011	11:35	321	
	n hon	1	4/14/2011	11:35	163	
	sive					

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- [REDACTED] Madison, IL	non- [REDACTED]	1	4/14/2011	14:00	271	The home is located on north property boundary, so no north side yard exists. A concrete sidewalk comprises the south side of the home, so no south side yard exists. Therefore, no side yard sampling could be completed at this home. A 3-point composite drip zone sample was collected rather than a 4-point composite because a concrete sidewalk was located along the south side of the residence. Duplicate sample collected in front yard.
	responsive [REDACTED]	1	4/14/2011	14:00	187	
	[REDACTED]	1	4/14/2011	14:00	179	
	[REDACTED]	1	4/14/2011	14:00	94.8	
	[REDACTED]	1	4/14/2011	13:57	366	
	[REDACTED]	1	4/14/2011	13:57	281	
	non- [REDACTED]	1	4/14/2011	13:57	195	
	responsive [REDACTED]	1	4/14/2011	14:13	180	
	[REDACTED]	1	4/14/2011	14:13	344	
	[REDACTED]	1	4/14/2011	14:13	543	
non- [REDACTED] Madison, IL	[REDACTED]	1	4/14/2011	15:11	390	No side yard sampling could be completed at this home. The north side of the home is located on the north property boundary and the south side of the home is comprised of an asphalt sidewalk. A 3-point composite drip zone sample was collected rather than a 4-point composite because an asphalt sidewalk was located along the south side of the residence.
	[REDACTED]	1	4/14/2011	15:11	351	
	[REDACTED]	1	4/14/2011	15:11	211	
	[REDACTED]	1	4/14/2011	15:06	358	
	[REDACTED]	1	4/14/2011	15:06	414	
	[REDACTED]	1	4/14/2011	15:06	351	
	[REDACTED]	1	4/14/2011	15:26	820	
	[REDACTED]-6	1	4/14/2011	15:26	1030	
	non- [REDACTED] no	1	4/14/2011	15:26	809	
non- [REDACTED] Avenue Madison, IL	non-responsive [REDACTED]	2	4/18/2011	15:13	302	No drip zone samples could be collected because this property is a vacant lot. Duplicate sample collected in quadrant four.
	[REDACTED]	2	4/18/2011	15:13	310	
	[REDACTED]	2	4/18/2011	15:13	719	
	[REDACTED]	2	4/18/2011	15:32	48.7	
	[REDACTED]	2	4/18/2011	15:32	20.5	
	[REDACTED]	2	4/18/2011	15:32	108	
	[REDACTED]	2	4/18/2011	15:07	86.1	
	[REDACTED]	2	4/18/2011	15:07	308	
	[REDACTED]	2	4/18/2011	15:07	361	
	[REDACTED]	2	4/18/2011	15:41	17.8	
	[REDACTED]	2	4/18/2011	15:41	20.1	
	[REDACTED]	2	4/18/2011	15:41	16.4	
	[REDACTED]	2	4/18/2011	15:41	41.5	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	2	4/18/2011	8:47	402	A small strip of grass comprises the property's north side. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. Similarly the south side of the home is comprised of a small strip of grass and a driveway. The small strip of grass is too small to be considered a side yard, so it was considered the southern drip zone. Therefore, no side yard sampling could be completed at this home. The drip zone on the west side, or back yard, is covered by a concrete sidewalk. Therefore, a 3-point composite drip zone sample was collected rather than a 4-point composite sample. Field blank (RL) no response. following bare play area sample collection and decontamination process of the stainless steel split spoon sampler. Duplicate sample collected in front yard.
		2	4/18/2011	8:47	384	
		2	4/18/2011	8:47	284	
		2	4/18/2011	8:47	158	
		2	4/18/2011	8:40	383	
		2	4/18/2011	8:40	362	
		2	4/18/2011	8:40	278	
		2	4/18/2011	9:08	378	
		2	4/18/2011	9:08	213	
		2	4/18/2011	9:08	91.3	
		2	4/18/2011	8:57	480	
		2	4/18/2011	8:57	503	
	non-responsive	2	4/18/2011	8:57	211	
non- Madison, IL		2	4/18/2011	10:46	245	No side yard sampling could be completed at this home. The north side of the home is comprised of a small strip of grass. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. A driveway comprises the south side of the home, so no side yard exists. Duplicate sample collected in drip zone.
		2	4/18/2011	10:46	140	
		2	4/18/2011	10:46	57.3	
		2	4/18/2011	10:50	163	
		2	4/18/2011	10:50	359	
		2	4/18/2011	10:50	411	
		2	4/18/2011	11:17	710	
		2	4/18/2011	11:17	742	
		2	4/18/2011	11:17	147	
	non-responsive	2	4/18/2011	11:17	383	
non- Granite City, IL	non-responsive	2	4/18/2011	13:32	359	A sidewalk is located on the east side of the home, therefore no side yard or drip zone exists on the east side of this property. A small strip of grass comprises the property's west side. The small strip of grass is too small to be considered a side yard, so it was considered the western drip zone. Therefore, a 3-point composite drip zone sample was collected rather than a 4-point composite sample.
		2	4/18/2011	13:32	337	
		2	4/18/2011	13:32	145	
		2	4/18/2011	13:27	485	
		2	4/18/2011	13:27	479	
		2	4/18/2011	13:27	237	
		2	4/18/2011	13:48	531	
		2	4/18/2011	13:48	435	
		2	4/18/2011	13:48	415	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	2	4/19/2011	10:41	393	A sidewalk and driveway comprise the south side of the home, therefore no drip zone or side yard exists on the south side of the property. For these reasons, a 3-point composite drip zone sample was collected rather than a 4-point composite sample. Field blank non-responsive was collected following drip zone sample collection and decontamination process of stainless steel split spoon sampler.
		2	4/19/2011	10:41	406	
		2	4/19/2011	10:41	474	
		2	4/19/2011	10:30	266	
		2	4/19/2011	10:30	271	
		2	4/19/2011	10:30	250	
		2	4/19/2011	11:07	359	
		2	4/19/2011	11:07	391	
		2	4/19/2011	11:07	310	
		2	4/19/2011	10:52	648	
		2	4/19/2011	10:52	440	
		2	4/19/2011	10:52	354	
non- Granite City, IL	non-responsive	2	4/19/2011	14:25	115	No drip zone samples could be collected due a concrete sidewalk located on all sides of the home. Duplicate sample collected in quadrant one.
		2	4/19/2011	14:25	146	
		2	4/19/2011	14:25	164	
		2	4/19/2011	14:25	100	
		2	4/19/2011	14:30	361	
		2	4/19/2011	14:30	494	
		2	4/19/2011	14:30	350	
		2	4/19/2011	13:49	140	
		2	4/19/2011	13:49	173	
		2	4/19/2011	13:49	107	
		2	4/19/2011	13:56	269	
		2	4/19/2011	13:56	334	
		2	4/19/2011	13:56	396	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Street Madison, IL	non-responsive	2	4/19/2011	15:49	182	The north side of the home is located along the north property boundary, therefore a side yard does not exist on the north side of this property. A 3-point composite drip zone sample was collected rather than a 4-point composite because a concrete sidewalk was located along the south side of the home.
		2	4/19/2011	15:49	175	
	non-responsive	2	4/19/2011	15:49	37.1	
		2	4/19/2011	15:46	137	
		2	4/19/2011	15:46	98.4	
		2	4/19/2011	15:46	472	
		2	4/19/2011	16:03	354	
		2	4/19/2011	16:03	392	
		2	4/19/2011	16:03	223	
		2	4/19/2011	16:12	458	
		2	4/19/2011	16:12	247	
		2	4/19/2011	16:12	94.7	
non- Madison, IL		2	4/20/2011	9:37	163	A 2-point composite drip zone sample was collected rather than a 4-point composite because an asphalt driveway and sidewalk were located on the south and west sides of the residence. Field blank (non-) was collected following quadrant three sample collection and decontamination process of stainless steel split spoon sampler. Duplicate sample collected in quadrant two.
		2	4/20/2011	9:37	92.7	
	non-responsive	2	4/20/2011	9:37	124	
		2	4/20/2011	8:54	146	
		2	4/20/2011	8:54	94.0	
		2	4/20/2011	8:54	94.1	
		2	4/20/2011	8:54	123	
		2	4/20/2011	9:02	194	
		2	4/20/2011	9:02	199	
		2	4/20/2011	9:02	188	
		2	4/20/2011	9:26	221	
		2	4/20/2011	9:26	159	
		2	4/20/2011	9:26	133	
		2	4/20/2011	9:47	78.3	
		2	4/20/2011	9:47	83	
		2	4/20/2011	9:47	167	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- [redacted]	non-responsive [redacted]	2	4/20/2011	11:05	17.3	Three parcels that have been combined into one property. This property is considered commercial with residential use. A 2-point composite drip zone sample was collected rather than a 4-point composite because a concrete pad was located below the soil along the north and west sides of the home and a sidewalk along the east side of the residence. The drip zone samples were collected over 5 feet apart on the south side of the structure. Duplicate sample collected in quadrant three.
	[redacted]	2	4/20/2011	11:05	12.1	
	[redacted]	2	4/20/2011	11:05	15.2	
	[redacted]	2	4/20/2011	11:12	17.1	
	non-responsive [redacted]	2	4/20/2011	11:12	10.6	
	[redacted]	2	4/20/2011	11:12	10.0	
	[redacted]	2	4/20/2011	11:31	19.7	
	[redacted]	2	4/20/2011	11:31	56.9	
	[redacted]	2	4/20/2011	11:31	26.9	
	[redacted]	2	4/20/2011	11:31	80.9	
	[redacted]	2	4/20/2011	11:39	16.4	
	[redacted]	2	4/20/2011	11:39	10.8	
	[redacted]	2	4/20/2011	11:39	35.1	
	[redacted]	2	4/20/2011	12:01	314	
	[redacted]	2	4/20/2011	12:01	441	
	[redacted]	2	4/20/2011	12:01	74.2	
non- [redacted] Madison, IL	non-responsive [redacted]	2	4/20/2011	14:07	356	The north side of the residence is located along the north property boundary, therefore no side yard exists on this side. A flower garden with weed fabric comprises the north and east sides of the home. The south side of the home has gravel along the house and a brick and concrete walkway is located on the west side of the home. For these reasons, no drip zone samples could be collected at this home.
	responsive [redacted]	2	4/20/2011	14:07	181	
	[redacted]	2	4/20/2011	14:07	158	
	[redacted]	2	4/20/2011	13:53	324	
	[redacted]	2	4/20/2011	13:53	208	
	[redacted]	2	4/20/2011	13:53	134	
	[redacted]	2	4/20/2011	14:17	343	
	[redacted]	2	4/20/2011	14:17	208	
	[redacted]	2	4/20/2011	14:17	124	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	2	4/20/2011	15:20	391	The north side of the home is located along the north property boundary, therefore no side yard exists. A 2-point composite drip zone sample was collected rather than a 4-point composite because a concrete sidewalk was located along the south and west sides of the home. Duplicate sample collected in front yard.
		2	4/20/2011	15:20	332	
		2	4/20/2011	15:20	413	
		2	4/20/2011	15:20	92.3	
		2	4/20/2011	15:03	312	
	non-responsive	2	4/20/2011	15:03	414	
		2	4/20/2011	15:03	537	
		2	4/20/2011	15:28	247	
		2	4/20/2011	15:28	217	
		2	4/20/2011	15:28	167	
		2	4/20/2011	15:44	540	
		2	4/20/2011	15:44	133	
		2	4/20/2011	15:44	21	
non-responsive	non-responsive	2	4/21/2011	9:26	493	This property is commercial with residential use. The south side of the home is located on the south property boundary and a sidewalk is located along the north and east sides of the home. Therefore, a 2-point composite drip zone sample was collected rather than a 4-point composite sample. Field blank (FB) was collected following decontamination process of stainless steel split spoon sampler used for quadrant one sampling. Duplicate sample collected in quadrant four.
	non-responsive	2	4/21/2011	9:26	563	
		2	4/21/2011	9:26	524	
		2	4/21/2011	9:15	145	
		2	4/21/2011	9:15	138	
		2	4/21/2011	9:15	78.4	
		2	4/21/2011	8:49	407	
		2	4/21/2011	8:49	261	
		2	4/21/2011	8:49	110	
		2	4/21/2011	9:42	356	
		2	4/21/2011	9:42	923	
		2	4/21/2011	9:42	357	
		2	4/21/2011	9:42	275	
		2	4/21/2011	9:47	620	
		2	4/21/2011	9:47	1160	
		2	4/21/2011	9:47	204	

Table 7
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Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- [redacted] Madison, IL	non-responsive [redacted]	3	5/2/2011	15:10	443	A sidewalk and driveway comprise the south side of the home, therefore no drip zone or side yard exist on the south side of the property. A small strip of grass comprises the property's north side. The small strip of grass is too small to be considered a side yard and has a gas line running through it, therefore no drip zone or side yard exist. Concrete sidewalks comprise the east and west sides of the home. Therefore, no side yard or drip zone samples could be collected from this home. Duplicate sample collected in back yard.
	[redacted]	3	5/2/2011	15:10	561	
	[redacted]	3	5/2/2011	15:10	184	
	[redacted]	3	5/2/2011	14:55	326	
	[redacted]	3	5/2/2011	14:55	266	
	[redacted]	3	5/2/2011	14:55	258	
	[redacted]	3	5/2/2011	14:55	310	
non- [redacted] Madison, IL	non-responsive [redacted]	3	5/2/2011	13:23	260	Per the phone conference on 4/21/2011, due to the irregular shape of the property, it was divided into three trisects for sampling.
	[redacted]	3	5/2/2011	13:23	241	
	[redacted]	3	5/2/2011	13:23	181	
	[redacted]	3	5/2/2011	13:39	308	
	[redacted]	3	5/2/2011	13:39	289	
	[redacted]	3	5/2/2011	13:39	314	
	[redacted]	3	5/2/2011	13:06	252	
	[redacted]	3	5/2/2011	13:06	306	
	[redacted]	3	5/2/2011	13:06	226	
	[redacted]	3	5/2/2011	13:55	432	
	[redacted]	3	5/2/2011	13:55	390	
	[redacted]	3	5/2/2011	13:55	310	
non- [redacted] Madison, IL	non-responsive [redacted]	3	5/2/2011	9:54	71.6	No drip zone samples could be collected because property is a vacant lot. Duplicate sample collected in quadrant three.
	[redacted]	3	5/2/2011	9:54	14.4	
	[redacted]	3	5/2/2011	9:54	13.4	
	[redacted]	3	5/2/2011	10:14	29	
	[redacted]	3	5/2/2011	10:14	23.7	
	[redacted]	3	5/2/2011	10:14	71.2	
	[redacted]	3	5/2/2011	10:37	70.8	
	[redacted]	3	5/2/2011	10:37	47.7	
	[redacted]	3	5/2/2011	10:37	62.1	
	[redacted]	3	5/2/2011	10:37	110	
	[redacted]	3	5/2/2011	10:53	111	
	[redacted]	3	5/2/2011	10:53	80.2	
	[redacted]	3	5/2/2011	10:53	147	
	[redacted]	3	5/2/2011	10:53	147	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- [redacted]	non responsive	3	5/2/2011	9:04	303	No side yard sampling could be completed at this home. A sidewalk and driveway comprise the north side of the home, therefore no side yard or drip zone exist. A small strip of grass is located on the south side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the southern drip zone. A 3-point composite drip zone sample was collected rather than a 4-point composite sample. Field blank (RP- non- [redacted]) collected following decontamination process of stainless steel split spoon sampler used for front yard sampling. The back yard was sampled on 4/21/2011, but due to unfavorable site conditions sampling was postponed until 5/2/2011.
	[redacted]	3	5/2/2011	9:04	236	
	[redacted]	3	5/2/2011	9:04	88.1	
	[redacted]	3	4/21/2011	11:19	302	
	[redacted]	3	4/21/2011	11:19	373	
	[redacted]	3	4/21/2011	11:19	459	
	[redacted]	3	5/2/2011	8:43	1090	
	[redacted]	3	5/2/2011	8:43	507	
	[redacted]	3	5/2/2011	8:43	285	
non- [redacted] responsi	[redacted]	3	5/3/2011	14:40	35.7	A flower garden, sidewalk and small strip of grass comprise the north side of the home. The small strip of grass is too small to be considered a side yard, therefore no side yard samples could be collected on the north side of the home. Bare play area located in central section of the back yard. Duplicate sample collected from drip zone.
	[redacted]	3	5/3/2011	14:40	55	
	non responsive	3	5/3/2011	14:40	171	
	[redacted]	3	5/3/2011	14:23	104	
	[redacted]	3	5/3/2011	14:23	58	
	[redacted]	3	5/3/2011	14:23	90.9	
	[redacted]	3	5/3/2011	14:51	52.1	
	[redacted]	3	5/3/2011	14:51	89.8	
	[redacted]	3	5/3/2011	14:51	397	
	[redacted]	3	5/3/2011	15:09	841	
	[redacted]	3	5/3/2011	15:09	1170	
	[redacted]	3	5/3/2011	15:09	1180	
	[redacted]	3	5/3/2011	15:09	1500	
	[redacted]	3	5/3/2011	15:03	135	
	[redacted]	3	5/3/2011	15:03	59.5	
	[redacted]	3	5/3/2011	15:03	117	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	3	5/3/2011	10:38	588	No side yard sampling could be completed at this home. A side walk is located on the north side of the home and the south side of the home is a gravel driveway. Duplicate sample collected in back yard.
		3	5/3/2011	10:38	329	
		3	5/3/2011	10:38	177	
		3	5/3/2011	10:23	263	
		3	5/3/2011	10:23	434	
	non-responsive	3	5/3/2011	10:23	456	
		3	5/3/2011	10:23	337	
		3	5/3/2011	10:53	1650	
		3	5/3/2011	10:53	1970	
		3	5/3/2011	10:53	390	
non- Madison, IL	non-responsive	3	5/3/2011	9:27	229	A small strip of grass comprises the property's north side. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. Field blank (RIF non- Ave-DZ-FB) was collected following decontamination process of stainless steel split spoon sampler used for drip zone sampling.
		3	5/3/2011	9:27	135	
		3	5/3/2011	9:27	63.1	
	non-responsive	3	5/3/2011	8:45	259	
		3	5/3/2011	8:45	282	
		3	5/3/2011	8:45	195	
		3	5/3/2011	9:13	216	
		3	5/3/2011	9:13	248	
		3	5/3/2011	9:13	216	
		3	5/3/2011	8:52	901	
		3	5/3/2011	8:52	430	
		3	5/3/2011	8:52	182	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
2336 Edison Avenue Granite City, IL	non-responsive	3	5/4/2011	14:14	337	Bare play area located in quadrant three. Duplicate sample collected in quadrant two.
		3	5/4/2011	14:14	185	
		3	5/4/2011	14:14	92.1	
		3	5/4/2011	15:00	275	
		3	5/4/2011	15:00	261	
	non-responsive	3	5/4/2011	15:00	165	
		3	5/4/2011	15:00	162	
		3	5/4/2011	14:49	162	
		3	5/4/2011	14:49	289	
		3	5/4/2011	14:49	327	
		3	5/4/2011	13:57	323	
		3	5/4/2011	13:57	343	
		3	5/4/2011	13:57	260	
		3	5/4/2011	15:14	1030	
		3	5/4/2011	15:14	1010	
	non-responsive	3	5/4/2011	15:14	419	
		3	5/4/2011	14:29	224	
		3	5/4/2011	14:29	136	
		3	5/4/2011	14:29	346	
1720 Edison Avenue Granite City, IL	non-responsive	3	5/4/2011	11:58	678	No side yard sampling could be completed at this home. A sidewalk and small strip of grass comprise the south side of the property and a small strip of grass comprises the north side of the property. The small strips of grass are too small to be considered side yards, so they were considered the southern and northern drip zones, respectively. Duplicate sample collected in front yard.
		3	5/4/2011	11:58	655	
		3	5/4/2011	11:58	602	
		3	5/4/2011	11:58	385	
		3	5/4/2011	11:33	551	
		3	5/4/2011	11:33	890	
		3	5/4/2011	11:33	608	
		3	5/4/2011	12:13	881	
	n	3	5/4/2011	12:13	2840	
	non-responsive	3	5/4/2011	12:13	617	

Table 7
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Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	3	5/4/2011	8:49	401	A 2-point composite drip zone was collected rather than a 4-point composite because the south and east sides of the home are comprised of a concrete sidewalk. Field blank (non-responsive) was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler.
		3	5/4/2011	8:49	670	
	non-responsive	3	5/4/2011	8:49	248	
		3	5/4/2011	8:37	448	
		3	5/4/2011	8:37	441	
		3	5/4/2011	8:37	336	
		3	5/4/2011	9:20	371	
		3	5/4/2011	9:20	127	
		3	5/4/2011	9:20	198	
		3	5/4/2011	9:06	299	
	non-responsive	3	5/4/2011	9:06	328	
		3	5/4/2011	9:06	330	
		3	5/4/2011	9:32	866	
		3	5/4/2011	9:32	740	
		3	5/4/2011	9:32	473	
non- Madison, IL	non-responsive	3	5/5/2011	8:42	212	No side yard sampling could be completed at this home. A driveway is located on the south side of the home, therefore, no side yard or drip zone exists on the south side of this property. A concrete walkway comprises the north side of the home, so no side yard or drip zone exists. The west side of the home is comprised of gravel, therefore, a 2-point composite drip zone sample was collected from the east side of the home rather than a 4-point composite sample. Field blank (non-responsive) was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler.
		3	5/5/2011	8:42	220	
		3	5/5/2011	8:42	110	
		3	5/5/2011	8:30	316	
		3	5/5/2011	8:30	245	
		3	5/5/2011	8:30	221	
		3	5/5/2011	9:07	129	
		3	5/5/2011	9:07	201	
		3	5/5/2011	9:07	156	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	3	5/5/2011	10:23	240	A small strip of grass comprises the property's north side. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. A 3-point drip zone sample was collected rather than a 4-point composite because the south side of the home was comprised of a concrete sidewalk. Duplicate sample collected in side yard.
		3	5/5/2011	10:23	183	
		3	5/5/2011	10:23	68.9	
		3	5/5/2011	10:03	407	
		3	5/5/2011	10:03	287	
		3	5/5/2011	10:03	242	
		3	5/5/2011	10:38	366	
		3	5/5/2011	10:38	303	
		3	5/5/2011	10:38	411	
	non-responsive	3	5/5/2011	10:38	202	
		3	5/5/2011	10:45	390	
		3	5/5/2011	10:45	207	
		3	5/5/2011	10:45	78.5	
		3	5/5/2011	10:45	78.5	
non- respon		3	5/5/2011	12:48	340	A driveway is located on the north side of the home, therefore no side yard or drip zone exists on the north side of the property. A gravel patch and small strip of grass comprise the property's south side. The small strip of grass is too small to be considered a side yard, so it was considered the southern drip zone. Therefore, no side yard sampling could be completed at this home. For these reasons, a 3-point composite drip zone sample was collected rather than a 4-point composite sample.
		3	5/5/2011	12:48	384	
		3	5/5/2011	12:48	161	
		3	5/5/2011	12:34	308	
	non-responsive	3	5/5/2011	12:34	432	
		3	5/5/2011	12:34	596	
		3	5/5/2011	13:03	775	
		3	5/5/2011	13:03	358	
		3	5/5/2011	13:03	370	
non- Granite City, IL	non-responsive	3	5/5/2011	14:42	381	No side yard sampling could be completed at this home. A sidewalk comprises the south side of the home, therefore no side yard or drip zone exists. A small strip of grass comprises the north side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. Therefore, a 3-point composite drip zone sample was collected rather than a 4-point composite sample. Duplicate sample collected in front yard.
	responsive	3	5/5/2011	14:42	318	
		3	5/5/2011	14:42	168	
		3	5/5/2011	14:42	200	
		3	5/5/2011	14:31	337	
		3	5/5/2011	14:31	348	
		3	5/5/2011	14:31	239	
		3	5/5/2011	15:07	729	
		3	5/5/2011	15:07	447	
		3	5/5/2011	15:07	425	
		3	5/5/2011	15:07	425	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	4	5/9/2011	15:19	320	No side yard sampling could be completed at this home. The home is located on the north property boundary, so no north side yard or drip zone exists on this side. An asphalt driveway, gravel patches, and garden comprise the south side of the home, therefore no side yard or drip zone exists on this side. A large flower garden comprises the west side of home. For these reasons, a 2-point composite drip zone sample was collected from the east side of the home, rather than a 4-point composite sample. Field blank (RP-2344 State St-FY-FB) was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler.
		4	5/9/2011	15:19	312	
		4	5/9/2011	15:19	270	
		4	5/9/2011	14:35	295	
		4	5/9/2011	14:35	362	
		4	5/9/2011	14:35	361	
		4	5/9/2011	14:50	757	
		4	5/9/2011	14:50	1560	
	non-responsive	4	5/9/2011	14:50	1340	
non- Avenue Madison, IL		4	5/10/2011	9:19	238	A gravel driveway is located on the north side of the home, therefore no side yard or drip zone exists on the north side of the property. A sidewalk comprises the south side of the home, so no drip zone exists on this side of the residence. Therefore, a 2-point composite drip zone sample was collected rather than a 4-point composite sample. A gravel parking area, garage and large brick patio covered with approximately three inches of soil comprise the west side of the home, or back yard, so no sampling could be completed. Field blank (RP-2344 State St-FY-FB) was collected following decontamination process of stainless steel split spoon sampler used for side yard sampling. Duplicate sample collected in side yard.
		4	5/10/2011	9:19	348	
		4	5/10/2011	9:19	184	
		4	5/10/2011	10:06	734	
		4	5/10/2011	10:06	790	
		4	5/10/2011	10:06	852	
		4	5/10/2011	10:06	376	
		4	5/10/2011	9:35	304	
		4	5/10/2011	9:35	832	
		4	5/10/2011	9:35	528	
non- Madison, IL	non-responsive	4	5/10/2011	14:44	309	A concrete sidewalk comprises the south side of the residence, therefore no side yard or drip zone exist on the property's south side. A concrete sidewalk comprises the north side of the home, so no drip zone exists. Therefore, a 2-point composite drip zone sample was collected rather than a 4-point composite sample.
		4	5/10/2011	14:44	292	
		4	5/10/2011	14:44	121	
		4	5/10/2011	13:15	324	
		4	5/10/2011	13:15	469	
		4	5/10/2011	13:15	496	
		4	5/10/2011	14:08	684	
		4	5/10/2011	14:08	900	
		4	5/10/2011	14:08	452	
		4	5/10/2011	13:36	1510	
		4	5/10/2011	13:36	1040	
		4	5/10/2011	13:36	334	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- [REDACTED] Madison, IL	non-responsive	4	5/10/2011	15:34	160	No side yard sampling could be completed at this home. A driveway and carport are located on the north side of the home, so no side yard or drip zone exist on the north side of the property. A small strip of grass comprises the south side of the home. The small strip of grass is too small to be considered a side yard, therefore it was considered the southern drip zone. A 3-point composite drip zone sample was collected rather than a 4-point composite sample. Duplicate sample collected in drip zone.
	[REDACTED]	4	5/10/2011	15:34	252	
	[REDACTED]	4	5/10/2011	15:34	284	
	[REDACTED]	4	5/10/2011	15:56	95.6	
	non-responsive	4	5/10/2011	15:56	297	
	[REDACTED]	4	5/10/2011	15:56	255	
	[REDACTED]	4	5/10/2011	16:12	753	
	[REDACTED]	4	5/10/2011	16:12	692	
	[REDACTED]	4	5/10/2011	16:12	339	
	[REDACTED]	4	5/10/2011	16:12	230	
non- [REDACTED] Granite City, IL	non-responsive	4	5/11/2011	14:43	392	No side yard sampling could be completed at this home. A driveway and small strip of grass comprise the north side of the home. A small strip of grass comprises the south side of the home as well. The small strips of grass are too small to be considered side yards, therefore they were considered the northern and southern drip zones respectively. The west side of the home, or front yard, is composed of large flower beds, so front yard sampling could not be completed. Duplicate sample collected in drip zone.
	[REDACTED]	4	5/11/2011	14:43	360	
	[REDACTED]	4	5/11/2011	14:43	393	
	[REDACTED]	4	5/11/2011	14:55	282	
	[REDACTED]	4	5/11/2011	14:55	341	
	[REDACTED]	4	5/11/2011	14:55	484	
	[REDACTED]	4	5/11/2011	14:55	306	
non- [REDACTED] Granite City, IL	non-responsive	4	5/11/2011	13:44	521	The home is located on the north property boundary, so no north side yard exists. A driveway and small strip of grass comprise the south side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the southern drip zone. Therefore, no side yard sampling could be completed at this home. The vegetable garden that was sampled is located in the northeast corner of the property.
	[REDACTED]	4	5/11/2011	13:44	550	
	[REDACTED]	4	5/11/2011	13:44	532	
	[REDACTED]	4	5/11/2011	13:30	411	
	[REDACTED]	4	5/11/2011	13:30	270	
	[REDACTED]	4	5/11/2011	13:30	415	
	[REDACTED]	4	5/11/2011	13:14	410	
	[REDACTED]	4	5/11/2011	13:14	313	
	[REDACTED]	4	5/11/2011	13:14	348	
	[REDACTED]	4	5/11/2011	13:38	489	
	[REDACTED]	4	5/11/2011	13:38	421	
	[REDACTED]	4	5/11/2011	13:38	358	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	4	5/11/2011	10:48	245	No side yard sampling could be completed at this home. The north side of the home is located on the northern property boundary, so no side yard exists. A driveway and concrete patio are located on the south side of the home, therefore no side yard or drip zone exists on the property's south side. For this reason, a 3-point composite drip zone sample was collected rather than a 4-point composite sample. Duplicate sample collected in drip zone.
		4	5/11/2011	10:48	193	
		4	5/11/2011	10:48	128	
		4	5/11/2011	10:20	271	
		4	5/11/2011	10:20	303	
		4	5/11/2011	10:20	346	
		4	5/11/2011	10:36	348	
		4	5/11/2011	10:36	230	
		4	5/11/2011	10:36	167	
		4	5/11/2011	10:36	159	
non- Granite City, IL	non-responsive	4	5/11/2011	9:07	270	A driveway and small strip of grass comprise the south side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the southern drip zone. A sidewalk is located along the north side of home, so no drip zone exists on the property's north side. Therefore, a 3-point composite drip zone sample was collected rather than a 4-point composite sample. Field blank (RIF non-FY-FB) was collected following decontamination process of stainless steel split spoon sampler used for front yard sampling.
		4	5/11/2011	9:07	337	
		4	5/11/2011	9:07	334	
		4	5/11/2011	8:54	353	
		4	5/11/2011	8:54	314	
		4	5/11/2011	8:54	322	
		4	5/11/2011	9:18	488	
		4	5/11/2011	9:18	393	
		4	5/11/2011	9:18	430	
		4	5/11/2011	9:28	458	
		4	5/11/2011	9:28	532	
		4	5/11/2011	9:28	324	
non- Granite City, IL	non-responsive	4	5/12/2011	8:57	313	A small strip of grass comprises the south side of the home. The small strip of grass is too small to be considered a side yard, therefore it was considered the southern drip zone. A driveway is located on the north side of the home, so no side yard or drip zone exist on the property's north side. For this reason, a 3-point composite drip zone sample was collected rather than a 4-point composite sample.
	responsive	4	5/12/2011	8:57	195	
		4	5/12/2011	8:57	70.9	
		4	5/12/2011	8:39	465	
		4	5/12/2011	8:39	491	
		4	5/12/2011	8:39	415	
		4	5/12/2011	9:15	737	
		4	5/12/2011	9:15	747	
		4	5/12/2011	9:15	403	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	4	5/12/2011	12:50	697	A driveway, flower garden, and sidewalk comprise the south side of the home, so no side yard or drip zone exist on the property's south side. A concrete sidewalk is located on all sides of the home, therefore no drip zone samples could be collected from this home. Field blank (RP non- B) was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler. Duplicate sample collected in side yard.
		4	5/12/2011	12:50	293	
		4	5/12/2011	12:50	407	
		4	5/12/2011	12:38	330	
		4	5/12/2011	12:38	327	
		4	5/12/2011	12:38	400	
	non-responsive	4	5/12/2011	13:10	724	
		4	5/12/2011	13:10	263	
		4	5/12/2011	13:10	188	
		4	5/12/2011	13:10	222	
non- Granite City, IL	non-	4	5/12/2011	14:17	544	The south side of the home is located along the south property boundary, so no side yard or drip zone exist on the south side of the property. A large deck covers the drip zone on the west side of the home and could not be accessed. For these reasons, a 2-point composite drip zone sample was collected rather than a 4-point composite sample. Due to the small size of the west side of the home or front yard, only a 2-point composite sample could be collected.
	responsive	4	5/12/2011	14:17	563	
		4	5/12/2011	14:17	457	
		4	5/12/2011	13:54	464	
		4	5/12/2011	13:54	543	
		4	5/12/2011	13:54	674	
	n	4	5/12/2011	14:30	422	
	non-responsive	4	5/12/2011	14:30	302	
		4	5/12/2011	14:30	166	
		4	5/12/2011	14:08	862	
		4	5/12/2011	14:08	587	
		4	5/12/2011	14:08	348	
non- Madison, IL	non-responsive	4	5/12/2011	15:38	277	No side yard sampling could be completed at this home. A concrete gutter is located on the north side of the home near the north property boundary, therefore no drip zone or side yard exist. A sidewalk and flower garden comprise the south side of the home, so no side yard or drip zone exist. No drip zones could be collected due to a concrete sidewalk located on all sides of the home. A 2-point composite sample was collected from the front yard, due to its small size.
		4	5/12/2011	15:38	316	
		4	5/12/2011	15:38	260	
		4	5/12/2011	15:35	261	
		4	5/12/2011	15:35	294	
		4	5/12/2011	15:35	239	

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NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non-responsive	non-responsive	5	5/16/2011	14:20	169	Field blank (FB) was collected following quadrant four sample collection and decontamination process of stainless steel split spoon sampler. Duplicate sample collected in quadrant two.
		5	5/16/2011	14:20	79.6	
		5	5/16/2011	14:20	56.7	
		5	5/16/2011	14:37	494	
		5	5/16/2011	14:37	362	
		5	5/16/2011	14:37	174	
		5	5/16/2011	14:37	273	
		5	5/16/2011	14:50	233	
		5	5/16/2011	14:50	269	
		5	5/16/2011	14:50	247	
		5	5/16/2011	15:00	192	
		5	5/16/2011	15:00	303	
		5	5/16/2011	15:00	241	
non-Granite City, IL	non-responsive	5	5/17/2011	15:10	257	A small strip of grass comprises the north side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone.
		5	5/17/2011	15:10	253	
		5	5/17/2011	15:10	189	
		5	5/17/2011	15:19	305	
		5	5/17/2011	15:19	347	
		5	5/17/2011	15:19	318	
		5	5/17/2011	15:35	663	
		5	5/17/2011	15:35	476	
		5	5/17/2011	15:35	324	
		5	5/17/2011	15:42	1410	
		5	5/17/2011	15:42	2090	
		5	5/17/2011	15:42	960	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	5	5/17/2011	14:32	2000	No side yard sampling could be completed at this home. A concrete driveway comprises the south side of the home, therefore no side yard or drip zone exists. A small strip of grass comprises the north side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. Flower gardens are located on the east side of the home, so no drip zone sample could be collected. Therefore, a 2-point composite drip zone sample was collected rather than a 4-point composite sample. A bare play area is located in the northwest section of the property. Duplicate sample collected in front yard.
		5	5/17/2011	14:32	227	
		5	5/17/2011	14:32	215	
		5	5/17/2011	14:32	206	
		5	5/17/2011	13:44	390	
		5	5/17/2011	13:44	365	
		5	5/17/2011	13:44	492	
		5	5/17/2011	13:54	971	
		5	5/17/2011	13:54	609	
		5	5/17/2011	13:54	474	
		5	5/17/2011	14:02	565	
		5	5/17/2011	14:02	485	
		5	5/17/2011	14:02	479	
non- Granite City, IL	non-responsive	5	5/17/2011	10:33	433	A driveway, patio and sidewalk completely encompass quadrant four. Therefore this quadrant was not sampled.
		5	5/17/2011	10:33	344	
		5	5/17/2011	10:33	316	
		5	5/17/2011	10:55	299	
		5	5/17/2011	10:55	365	
		5	5/17/2011	10:55	306	
		5	5/17/2011	10:19	559	
		5	5/17/2011	10:19	438	
		5	5/17/2011	10:19	637	
		5	5/17/2011	10:35	787	
		5	5/17/2011	10:35	583	
		5	5/17/2011	10:35	501	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Granite City, IL	non-responsive	5	5/17/2011	8:54	873	The west side of the home is located on the western property boundary, therefore a drip zone could not be collected from the west side of the property. The drip zone on the south side of the home is covered by an awing and the north and east drip zones are covered with concrete sidewalks. Therefore, no drip zone sampling could be completed at this home. Field blank (RP-1643 Delmar Ave-Q2-FB) was collected following the decontamination process of stainless steel split spoon sampler used for quadrant two sampling. Duplicate sample collected in quadrant four.
		5	5/17/2011	8:54	914	
		5	5/17/2011	8:54	715	
		5	5/17/2011	8:36	953	
		5	5/17/2011	8:36	957	
		5	5/17/2011	8:36	558	
		5	5/17/2011	8:25	1350	
		5	5/17/2011	8:25	1160	
		5	5/17/2011	8:25	1100	
		5	5/17/2011	9:07	1090	
		5	5/17/2011	9:07	907	
		5	5/17/2011	9:07	369	
		5	5/17/2011	9:07	421	
		5	5/17/2011	9:07	421	
non- Avenue Madison, IL		5	5/18/2011	15:00	811	
		5	5/18/2011	15:00	683	
		5	5/18/2011	15:00	473	
	non-responsive	5	5/18/2011	16:30	726	
		5	5/18/2011	16:30	587	
		5	5/18/2011	16:30	683	
		5	5/18/2011	14:30	578	
		5	5/18/2011	14:30	512	
		5	5/18/2011	14:30	843	
		5	5/18/2011	16:18	425	
		5	5/18/2011	16:18	454	
		5	5/18/2011	16:18	268	
		5	5/18/2011	16:35	873	
		5	5/18/2011	16:35	1640	
		5	5/18/2011	16:35	513	
		5	5/18/2011	16:35	513	
		5	5/18/2011	16:35	513	
		5	5/18/2011	16:35	513	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non-responsive	non-responsive	5	5/18/2011	12:42	533	A 2-point composite drip zone sample was collected rather than a 4-point composite because the north and south sides of the home were comprised of concrete sidewalks. Duplicate sample collected in quadrant two.
		5	5/18/2011	12:42	520	
		5	5/18/2011	12:42	430	
		5	5/18/2011	13:30	418	
		5	5/18/2011	13:30	387	
		5	5/18/2011	13:30	424	
		5	5/18/2011	13:30	465	
		5	5/18/2011	12:09	425	
		5	5/18/2011	12:09	1480	
		5	5/18/2011	12:09	319	
		5	5/18/2011	13:10	340	
	non-responsive	5	5/18/2011	13:10	320	
		5	5/18/2011	13:10	416	
		5	5/18/2011	13:38	568	
		5	5/18/2011	13:38	434	
		5	5/18/2011	13:38	754	
non-Madison, IL	non-responsive	5	5/18/2011	8:58	264	A 3-point composite drip zone sample was collected rather than a 4-point composite because the south side of the home was comprised of a flower bed and a concrete driveway. The home owner stated that the majority of quadrant three was filled in after a swimming pool was removed from the area. Field blank (RP-1617 Elizabeth St-Q1-FB) was collected following quadrant one sample collection and decontamination process of stainless steel split spoon sampler. Duplicate sample collected in quadrant four.
		5	5/18/2011	8:58	262	
		5	5/18/2011	8:58	362	
		5	5/18/2011	9:40	237	
		5	5/18/2011	9:40	118	
		5	5/18/2011	9:40	222	
		5	5/18/2011	8:45	106	
		5	5/18/2011	8:45	169	
		5	5/18/2011	8:45	284	
		5	5/18/2011	9:16	228	
		5	5/18/2011	9:16	262	
	non-responsive	5	5/18/2011	9:16	279	
		5	5/18/2011	9:16	354	
		5	5/18/2011	9:52	225	
		5	5/18/2011	9:52	214	
		5	5/18/2011	9:52	285	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non-responsive Granite City, IL	non-responsive	5	5/19/2011	8:52	586	A driveway and small strip of grass comprise the north side of the home. The small strip of grass is too small to be considered a side yard, so it was considered the northern drip zone. A 3-point composite drip zone sample was collected rather than a 4-point composite sample because a patio is located on the east side of the home. Field blank (RP-2214 Delmar Ave-FY-FB) was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler. Duplicate sample collected in back yard.
		5	5/19/2011	8:52	462	
		5	5/19/2011	8:52	231	
		5	5/19/2011	8:40	586	
		5	5/19/2011	8:40	405	
		5	5/19/2011	8:40	355	
		5	5/19/2011	8:40	296	
	non-responsive	5	5/19/2011	9:04	448	
		5	5/19/2011	9:04	340	
		5	5/19/2011	9:04	212	
		5	5/19/2011	9:10	3190	
		5	5/19/2011	9:10	2550	
		5	5/19/2011	9:10	1160	
non-responsive	non-responsive	5	5/19/2011	10:21	809	A patio is located on the north side of the apartment building, so no drip zone exists on the north side of the building. The drip zone along the south and west side of the apartment building are covered with a concrete sidewalk and the west side of the building is comprised of gravel. Therefore, no drip zone samples could be collected at this property. Duplicate sample collected in quadrant four.
		5	5/19/2011	10:21	734	
		5	5/19/2011	10:21	341	
	non-responsive	5	5/19/2011	10:05	476	
		5	5/19/2011	10:05	451	
		5	5/19/2011	10:05	447	
		5	5/19/2011	10:48	628	
		5	5/19/2011	10:48	751	
		5	5/19/2011	10:48	508	
		5	5/19/2011	10:33	301	
		5	5/19/2011	10:33	325	
		5	5/19/2011	10:33	378	
		5	5/19/2011	10:33	381	

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Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Street, Venice, IL	non-responsive	6	9/19/2012	15:20	205	A duplicate sample was collected from the drip zone sample from 0-3. Field blank (RP-505 Meredocia St-DZ-6-12-FB) was collected following drip zone sample collection and decontamination process of the stainless steel split spoon sampler. A vegetable garden is located in the backyard.
		6	9/19/2012	15:20	203	
		6	9/19/2012	15:20	209	
	non-responsive	6	9/19/2012	16:00	194	
		6	9/19/2012	16:00	179	
	non-responsive	6	9/19/2012	16:00	134	
		6	9/19/2012	16:00	106	
		6	9/19/2012	14:55	156	
		6	9/19/2012	14:55	142	
		6	9/19/2012	14:55	80.8	
		6	9/19/2012	15:45	143	
		6	9/19/2012	15:45	173	
		6	9/19/2012	15:45	577	
		6	9/19/2012	15:45	577	
non- Street, Venice, IL	non-responsive	6	9/20/2012	10:15	349	
		6	9/20/2012	10:15	406	
		6	9/20/2012	10:15	377	
		6	9/20/2012	8:30	198	
		6	9/20/2012	8:30	171	
		6	9/20/2012	8:30	218	
		6	9/20/2012	9:45	300	
		6	9/20/2012	9:45	318	
		6	9/20/2012	9:45	334	
		6	9/20/2012	9:05	332	
		6	9/20/2012	9:05	364	
		6	9/20/2012	9:05	305	
		6	9/20/2012	10:05	240	
		6	9/20/2012	10:05	236	
	non-responsive	6	9/20/2012	10:05	226	

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Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Street, Venice, IL	non-responsive	6	9/20/2012	11:45	73.3	Vacant property: no drip zone samples collected. A duplicate sample was collected in quadrant three.
		6	9/20/2012	11:45	81.9	
		6	9/20/2012	11:45	81.5	
		6	9/20/2012	12:35	154	
		6	9/20/2012	12:35	104	
		6	9/20/2012	12:35	290	
		6	9/20/2012	11:15	262	
		6	9/20/2012	11:15	310	
		6	9/20/2012	11:15	344	
		6	9/20/2012	11:15	124	
		6	9/20/2012	12:05	1190	
		6	9/20/2012	12:05	494	
		6	9/20/2012	12:05	191	
non-	non-responsive	6	9/20/2012	15:40	238	This property is vacant: no drip zone samples were collected. A duplicate sample was collected in quadrant one.
		6	9/20/2012	15:40	405	
		6	9/20/2012	15:40	367	
		6	9/20/2012	15:40	170	
		6	9/20/2012	14:15	159	
		6	9/20/2012	14:15	211	
		6	9/20/2012	14:15	198	
		6	9/20/2012	14:35	321	
		6	9/20/2012	14:35	338	
		6	9/20/2012	14:35	210	
		6	9/20/2012	15:00	157	
		6	9/20/2012	15:00	353	
		6	9/20/2012	15:00	148	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Street, Venice, IL	non-responsive	6	9/20/2012	17:10	258	The north side of the property was not sufficiently wide enough to sample as a side yard. Therefore, only one side yard was sampled. A field blank (RP-600 Meredocia St-SY2-6-12-FB) was collected following the side yard-2 sample collection and decontamination process of the stainless steel split spoon sampler.
		6	9/20/2012	17:10	309	
		6	9/20/2012	17:10	381	
		6	9/20/2012	17:40	101	
		6	9/20/2012	17:40	81.3	
		6	9/20/2012	17:40	99	
		6	9/20/2012	16:50	135	
		6	9/20/2012	16:50	140	
		6	9/20/2012	16:50	154	
		6	9/20/2012	17:55	142	
		6	9/20/2012	17:55	113	
		6	9/20/2012	17:55	122	
non- Madison, IL		6	9/19/2012	13:45	184	This house occupies two parcels. The sampling plan was approved prior to conducting soil sampling activities. The east side of the residence was not included in the sampling area for quadrant two due to the presence of utilities and a brick pad along that side of the property. A duplicate sample was collected from quadrant three. A vegetable garden in the back yard was sampled
		6	9/19/2012	13:45	256	
		6	9/19/2012	13:45	163	
	non-responsive	6	9/19/2012	11:45	329	
		6	9/19/2012	11:45	376	
		6	9/19/2012	11:45	209	
		6	9/19/2012	11:20	197	
		6	9/19/2012	11:20	147	
		6	9/19/2012	11:20	135	
	non-responsive	6	9/19/2012	12:20	390	
		6	9/19/2012	12:20	368	
		6	9/19/2012	12:20	388	
		6	9/19/2012	12:20	509	
		6	9/19/2012	13:00	337	
		6	9/19/2012	13:00	400	
		6	9/19/2012	13:00	540	
		6	9/19/2012	13:25	83	
		6	9/19/2012	13:25	91.5	
		6	9/19/2012	13:25	310	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	6	9/19/2012	10:10	2730	Sidewalks along the south side of the property prohibited sampling of side yard-2. The gravel driveway extends from the asphalt drive to the garage in the back of the lot. The drip zone is a 3 point composite sample because concrete 1-2 inches under gravel extends across the southern edge and corners of the building. Due to the condition of the backyard samples upon receipt from the lab, the backyard samples were resampled on 9/20/12.
		6	9/19/2012	10:10	2670	
		6	9/19/2012	10:10	2540	
		6	9/19/2012	9:35	489	
		6	9/19/2012	9:35	567	
		6	9/19/2012	9:35	141	
		6	9/19/2012	8:55	446	
		6	9/19/2012	8:55	524	
		6	9/19/2012	8:55	248	
		6	9/20/2012	18:45	494	
		6	9/20/2012	18:45	470	
		6	9/20/2012	18:45	267	
non- Madison, IL		7	6/10/2013	13:30	99.8	Vacant property: no drip zone samples collected.
		7	6/10/2013	13:30	183	
		7	6/10/2013	13:30	113	
		7	6/10/2013	13:55	258	
	n	7	6/10/2013	13:55	283	
	non-responsive	7	6/10/2013	13:55	300	
		7	6/10/2013	14:30	41.8	
		7	6/10/2013	14:30	74	
		7	6/10/2013	14:30	121	
		7	6/10/2013	15:35	247	
		7	6/10/2013	15:35	348	
	n	7	6/10/2013	15:35	381	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
non- Madison, IL	non-responsive	7	6/10/2013	16:40	41.3	No samples were collected from quadrant four due to a concrete slab which extends across the entirety of quadrant four and part of quadrant three. The soil sample aliquots for quadrant three were adjusted to account for the presence of the concrete slab. A duplicate sample was collected in quadrant three. A field blank (RP-1007 GRAND AVE-Q3-6-12-FB) was collected following the quadrant three sample collection and decontamination process of the stainless steel split spoon sampler.
		7	6/10/2013	16:40	25.3	
		7	6/10/2013	16:40	147	
		7	6/10/2013	17:10	45.7	
		7	6/10/2013	17:10	85.1	
		7	6/10/2013	17:10	300	
		7	6/10/2013	17:40	27.1	
		7	6/10/2013	17:40	314	
		7	6/10/2013	17:40	338	
		7	6/10/2013	17:40	1950	
non- Granite City, IL	non-responsive	7	6/11/2013	7:25	218	The side yards were not sufficiently wide to be sampled. The distribution of soil sampling aliquots in the front yard were adjusted due to the presence of multiple utilities along the south side of the front yard. A field blank (RP-2335 EDISON AVE-DZ-6-12-FB) was collected following the drip zones sample collection and decontamination process of the stainless steel split spoon sampler.
		7	6/11/2013	7:25	238	
		7	6/11/2013	7:25	180	
		7	6/11/2013	8:25	336	
		7	6/11/2013	8:25	296	
		7	6/11/2013	8:25	98.2	
		7	6/11/2013	9:05	571	
		7	6/11/2013	9:05	337	
		7	6/11/2013	9:05	68.1	
non- Granite City, IL		8	10/9/2013	14:10	113	This lot was vacant was therefore sampled using the quadrant approach. Quadrant 3: 6-12" sample was only a four point aliquot as the northeastern most boring location encountered sandy concrete and was unable to advance past 6". A duplicate sample was collected in quadrant three. A field blank (RP-1731 Chestnut St-Q1-6-12-FB) was collected following the sample collection in Quadrant 1 and the decontamination process of the stainless steel split spoon sampler.
	non-responsive	8	10/9/2013	14:10	262	
		8	10/9/2013	14:10	200	
		8	10/9/2013	13:15	324	
		8	10/9/2013	13:15	337	
		8	10/9/2013	13:15	377	
		8	10/9/2013	12:20	300	
		8	10/9/2013	12:20	241	
		8	10/9/2013	12:20	224	
		8	10/9/2013	12:20	333	
		8	10/9/2013	12:05	692	
		8	10/9/2013	12:05	1600	
	no	8	10/9/2013	12:05	694	

Table 7
NL Industries/Taracorp Superfund Site
Summary of Analytical Results

Residential Property	Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Comments
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Notes:

Bolded and gray highlighted cells indicate lead concentrations above 500 mg/kg.

Sample Identification location abbreviations: RP = residential property, CRP = commercial/residential property; FY = front yard; BY = back yard; SY = side yard; DZ = drip zone; FD = field duplicate, Q = quadrant; VG = vegetable garden; BPA = bare play area

All concentrations listed in milligrams per kilogram (mg/kg) dry weight.

All sample aliquots collected from 0-3, 3-6 or 6-12 inches below land surface

All front, back, and side yard samples collected were comprised of 5 aliquots each. Drip zone samples were comprised of 4 aliquots unless site conditions warranted otherwise.

Sample identifications are listed as shown in the ICWP. Adjustments to the sample identifications that vary from the Lab report are summarized below:

* Indicates this sample was incorrectly labeled on the COC as *ID-DUP* rather than *ID-FD* as required by the ICWP. For consistency, the name has been changed to *ID-FD* on this table, although the name appears on the COC and lab report as *ID-DUP*.

**Indicates this sample identification is shown as *ID-F* in the Pace Analytical Reports rather than *ID-FD* as it is listed on the COC and is required by the ICWP. The truncation is due to character limitations for the client ID name on the laboratory report.

Table 8
NL Industries/Taracorp Superfund Site
Proposed Excavation Details

Property Type/ Number	Address	Front Yard			Back Yard			Side Yard			Drip Zone			Bare play area/vegetable			Total yds ³ (nearest yd ³)
		Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	
DAP 7	non-	500	3	4.6							130	6	2.4				7
DAP 14	non-	650	3	6.0	1900	3	17.6				160	12	5.9				30
DAP 16	responsiv	630	6	11.7	2100	12	77.8				295	12	10.9				100
DAP 23	e	400	3	3.7							325	3	3.0				7
DAP 24					1250	12	46.3				275	6	5.1				51
DAP 34	non- non-							375	12	13.9	195	3	1.8				16
DAP 36	o				1875	12	69.4				45	3	0.4				70
DAP 37	n	405	6	7.5													8
DAP 39	r													65	6	1.2	1
DAP 44	e				705	12	26.1				190	3	1.8				28
DAP 54	s													375	12	13.9	14
DAP 65	p	240	6	4.4	1500	12	55.6				80	6	1.5				61
DAP 74	a	650	6	12.0							110	6	2.0				14
DAP 75	s	700	3	6.5				300	3	2.8							9
DAP 77	L	600	3	5.6							175	6	3.2	35	3	0.3	9
DAP 78	v							230	3	2.1	250	12	9.3				11
DAP 58	e													315	12	11.7	12
DAP 15		340	6	6.3				405	6	7.5	108	12	4.0				18
SEPP 52								345	6	6.4	300	12	11.1				18
SEPP 15								220	6	4.1	290	6	5.4				9
Subtotal for excavation																	493

Address	Address	Quadrant 1			Quadrant 2			Quadrant 3			Quadrant 4			Drip Zone			Total yds ³ (nearest yd ³)
		Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	Area (ft ²)	Depth (in.)	yds ³	
DAP 9	non-							810	12	30.0				300	12	11.1	41
DAP 10	responsi										1675	12	62.0				62
DAP 13	vo	1190	12	44.1	1190	12	44.1	1190	12	44.1	1190	6	22.0				154
DAP 28								420	12	15.6							16
DAP 30								1550	12	37.4				385	3	3.6	41
DAP 43								2070	12	76.7	2390	12	88.5				165
DAP 46/47		465	12	17.2							1395	6	25.8	55	6	1.0	44
DAP 51		780	12	28.9													29
DAP 60											1550	3	14.4				14
DAP 70		200	6	3.7				1375	6	25.5				62.5	12	2.3	31
DAP 79/80		1200	6	22.2				950	12	35.2							57
DAP 84	non-	750	6	13.9	1600	12	59.3	2150	12	79.6				372.5	12	13.8	167
Subtotal for excavation																	822
Total yds ³ excavation																	1315

Notes:

* Denotes access for remediation for is currently pending.

Table 9
NL Industries/Taracorp Superfund Site
Quality Assurance Summary: Field Duplicate Samples

Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Difference	Average/ RPD
non-responsive	1	4/11/2011	11:35	123	-59.9	93.05
	1	4/11/2011	11:35	63.1		64%
	1	4/12/2011	9:50	386	32	402
	1	4/12/2011	9:50	418		8%
	1	4/12/2011	13:40	279	41	299.5
	1	4/12/2011	13:40	320		14%
	1	4/12/2011	16:12	138	11	143.5
	1	4/12/2011	16:12	149		8%
	1	4/13/2011	13:29	301	92	347
	1	4/13/2011	13:29	393		27%
	1	4/14/2011	9:13	547	36	565
	1	4/14/2011	9:13	583		6%
	1	4/14/2011	14:00	187	-8	183
	1	4/14/2011	14:00	179		4%
non-responsive	2	4/18/2011	15:41	20.1	-3.7	18.25
	2	4/18/2011	15:41	16.4		20%
	2	4/18/2011	8:47	402	-18	393
	2	4/18/2011	8:47	384		5%
	2	4/18/2011	11:17	147	236	265
	2	4/18/2011	11:17	383		89%
	2	4/19/2011	14:25	115	31	115
	2	4/19/2011	14:25	146		27%
	2	4/20/2011	8:54	94.1	28.9	108.55
	2	4/20/2011	8:54	123		27%
	2	4/20/2011	11:31	56.9	-30	42
	2	4/20/2011	11:31	26.9		72%
non-responsive	2	4/20/2011	15:20	391	-59	362
	2	4/20/2011	15:20	332		16%

Table 9
NL Industries/Taracorp Superfund Site
Quality Assurance Summary: Field Duplicate Samples

Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Difference	Average/ RPD
non-responsive	2	4/21/2011	9:42	357	-82	316
	2	4/21/2011	9:42	275		26%
	3	5/2/2011	14:55	326	-60	296
	3	5/2/2011	14:55	266		20%
	3	5/2/2011	10:37	47.7	14.4	55
	3	5/2/2011	10:37	62.1		26%
	3	5/3/2011	15:09	1170	10	1175
	3	5/3/2011	15:09	1180		1%
	3	5/3/2011	10:23	456	-119	397
	3	5/3/2011	10:23	337		30%
	3	5/4/2011	15:00	165	-3	164
	3	5/4/2011	15:00	162		2%
	3	5/4/2011	11:58	678	-23	667
	3	5/4/2011	11:58	655		3%
	3	5/5/2011	10:38	303	108	357
	3	5/5/2011	10:38	411		30%
	3	5/5/2011	14:42	168	32	184
	3	5/5/2011	14:42	200		17%
	4	5/10/2011	10:06	790	62	821
	4	5/10/2011	10:06	852		8%
	4	5/10/2011	16:12	753	-61	723
	4	5/10/2011	16:12	692		8%
	4	5/11/2011	14:55	341	143	413
	4	5/11/2011	14:55	484		35%
	4	5/11/2011	10:36	167	-8	163
	4	5/11/2011	10:36	159		5%
	4	5/12/2011	13:10	188	34	205
	4	5/12/2011	13:10	222		17%
	5	5/16/2011	14:37	494	-132	428
	5	5/16/2011	14:37	362		31%

Table 9
NL Industries/Taracorp Superfund Site
Quality Assurance Summary: Field Duplicate Samples

Sample Identification	Week Sampled	Sample Date	Sample Time	Lead (mg/kg)	Difference	Average/ RPD
non-responsive	5	5/17/2011	14:32	227	-12	221
	5	5/17/2011	14:32	215		5%
	5	5/17/2011	9:07	369	52	395
	5	5/17/2011	9:07	421		13%
	5	5/18/2011	13:30	387	37	406
	5	5/18/2011	13:30	424		9%
	5	5/18/2011	9:16	228	34	245
	5	5/18/2011	9:16	262		14%
	5	5/19/2011	8:40	586	-181	496
	5	5/19/2011	8:40	405		37%
non-responsive	5	5/19/2011	10:33	378	3	380
	5	5/19/2011	10:33	381		1%
	6	9/19/2012	16:00	194	-15	187
	6	9/19/2012	16:00	179		8%
	6	9/20/2012	11:15	310	34	327
	6	9/20/2012	11:15	344		10%
	6	9/20/2012	15:40	238	167	321.5
	6	9/20/2012	15:40	405		52%
	6	9/19/2012	12:20	368	20	378
	6	9/12/2012	12:20	388		5%
	7	6/10/2013	17:40	314	24	326
	7	6/10/2013	17:40	338		7%
non-responsive	7	10/9/2013	12:40	300	-59	271
	7	10/9/2013	12:40	241		22%

Notes:

RPD= Relative Percent Difference.

Bold and gray highlighted values indicate RPD values that exceed the 30% precision criteria.

Table 10
NL Industries/Taracorp Superfund Site
Quality Assurance Summary: Field Blank Samples

Sample ID	Sample Date	Sample Time	Lead (ug/L)	Comment
non- responsi ve	4/11/2011	10:20	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and side yard sample collection of non-
	4/12/2011	9:00	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and quadrant one sampling of non-
	4/13/2011	9:15	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and front yard sampling of non-
	4/14/2011	8:45	<0.0050	Field blank was collected following quadrant two sampling and decontamination process of stainless steel split spoon sampler at non-
	4/18/2011	8:58	<0.0050	Field blank was collected following bare play area sample collection and decontamination process of stainless steel split spoon sampler at non- Street.
	4/19/2011	10:56	<5.0	Field blank was collected following decontamination process of stainless steel split spoon sampler and drip zone sample collection at non-
	4/20/2011	8:14	<0.0050	Field blank was collected following quadrant three sample collection and decontamination process of stainless steel split spoon sampler at non-
	4/21/2011	9:20	<0.0050	Field blank was collected following quadrant one sample collection and decontamination process of stainless steel split spoon sampler at non-
	5/2/2011	9:15	<0.0050	Field blank was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler at non- Street.
	5/3/2011	9:04	<0.0050	Field blank was collected following drip zone sample collection and decontamination process of stainless steel split spoon sampler at non-
	5/4/2011	8:58	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and front yard sample collection of non-
	5/5/2011	8:58	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and front yard sample collection of non-
non- responsive	5/9/2011	15:30	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and front yard sample collection of non-
	5/10/2011	10:13	<0.0050	Field blank was collected following decontamination process of stainless steel split spoon sampler and side yard sample collection of non-
	5/11/2011	9:15	<0.0050	Field blank was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler at non- e.
	5/12/2011	12:55	<5.0	Field blank was collected following front yard sample collection and decontamination process of stainless steel split spoon sampler at non- Street.
	5/16/2011	15:05	<5.0	Field blank was collected following quadrant four sample collection and decontamination process of stainless steel split spoon sampler at 1 non-
	5/17/2011	9:07	<5.0	Field blank was collected following quadrant two sample collection and decontamination process of stainless steel split spoon sampler at non-

Table 10
NL Industries/Taracorp Superfund Site
Quality Assurance Summary: Field Blank Samples

Sample ID	Sample Date	Sample Time	Lead (ug/L)	Comment
non-responsive	5/18/2011	9:09	<5.0	Field blank was collected following decontamination process of stainless steel split spoon sampler and quadrant one sample collection of non-
	5/19/2011	8:59	<5.0	Field blank was collected following decontamination process of stainless steel split spoon sampler and front yard sample collection of non-
	9/19/2012	16:15	<5.0	The field blank was collected following the decontamination process of the stainless steel split spoon sampler which was used in the drip zone at non-
	9/20/2012	18:20	<5.0	The field blank was collected following the decontamination process of the stainless steel split spoon sampler which was used in the side yard of non-
	6/10/2013	17:50	12	The field blank was collected following the decontamination process of the stainless steel split spoon sampler which was used quadrant three of non-. A detection of 0.010 mg/L was reported. A confirmation sample was analyzed and reported as 0.012 mg/L. The project samples were validated; no project data were compromised by this detection.
	6/11/2013	9:20	<5.0	The field blank was collected following the decontamination process of the stainless steel split spoon sampler which was used in the drip zone of non-
	10/9/2013	14:20	<5.0	The field blank was collected following the decontamination process of the stainless steel split spoon sampler which was used in quadrant 1 of non-

Concentrations following a less than symbol indicate no lead was detected below the indicated reporting limit (<reporting limit).

FIGURES

Figure 1 *Site Location Topographic Map*

Figure 2 *Site Location Aerial Photograph Map*

Figure 3a-3e *Properties Selected for Soil Sampling*

APPENDICES

Appendix A Residential Property Letters and Signed Access Agreements

Appendix B Site Health and Safety Plan

Appendix C Analytical Laboratory Reports and Additional Documentation

Appendix D Photographic Documentation

Appendix E Residential Property Maps and Sample Locations

Appendix F Soil Remediation Location Maps

APPENDIX A

Residential Property Letters and Signed Access Agreements

APPENDIX B

Site Health and Safety Plan

APPENDIX C

Analytical Laboratory Reports

APPENDIX D

Photographic Documentation

APPENDIX E

Residential Property Maps and Sample Locations

APPENDIX F

Soil Remediation Location Maps

Appendix H

Excavation Advisory For “Battery Chips” in Remote Fill Areas

J.U.L.I.E. Ticket No. _____

Name: _____

Address: _____

EXCAVATION ADVISORY:

FOR NL INDUSTRIES/TARACORP SUPERFUND SITE
IN GRANITE CITY, MADISON, AND VENICE ILLINOIS

PLEASE REVIEW THIS IMPORTANT HEALTH AND SAFETY INFORMATION BEFORE YOU DIG AT THIS ADDRESS AND PROVIDE THIS INFORMATION TO EVERYONE WHO WILL PERFORM WORK AT THIS ADDRESS.

J.U.L.I.E., the Illinois One-Call System, has notified the NL Industries/Taracorp Superfund Site Group and its contractor, e-Locate Services LLC (ELS), that you called J.U.L.I.E. because you plan to dig into or excavate soil that is, or may be, contaminated with lead from a closed lead smelter in Granite City, Illinois. Please read this information regarding potential health hazards and other important information.

LEAD-CONTAINING SOIL AND BATTERY CASE CHIPS

When you dig or excavate at the address indicated above, you may find lead-containing soil or battery case chips. Battery case chips are small (normally 1/2-inch to 2-inch diameter, but can be smaller or larger) pieces of black hard rubber (newer chips may also be other colors or white pieces of plastic) that came from crushing or shredding lead-acid car or truck batteries during recycling. Battery case chips are usually flat but may have a triangular shape if they came from the corner of the battery case.



PROTECTIVE MEASURES

When you dig or excavate at the address indicated above, the best way to protect yourself from potential lead exposure is to avoid contact with lead-containing soil and battery case chips. If you cannot avoid handling lead-containing soil and battery case chips, you should use the following good work practices and protective measures:

- Keep people away from the work area, especially children. Also, keep pets away from work area.
- Keep the soil moist to control dust.
- In dusty areas, wear a dust mask or respirator to minimize inhaling or swallowing airborne dust or soil particles.
- Wear protective clothing (boots, shirts, pants, and gloves) and launder the protective clothing separately from other clothes after completing each day's work.
- Do not drink, eat, or smoke, or do anything that may put soil or dust into your mouth.
- Wash all exposed body surfaces and your hair, preferably by showering, after completing each day's work.
- Avoid tracking soil into your home. If this occurs, clean it up immediately.

DISPOSAL AND PROPERTY RESTORATION

If you are digging or excavating at the property and find battery case chips and soil that may possibly contain high levels of lead, you should:

- Protect yourself from potential lead exposure by following the protective measures listed above, and
- Dispose of the battery case chips and soil in one of the following ways:

- If you are a residential property owner and find a small amount of battery case chips, remove the battery case chips from the soil and place them in your trash container (store your trash container outside, not inside your house or garage, in a place where the trash will not be disturbed) until your trash hauler picks up and transports your trash to an approved disposal facility; or
- If you find a large amount of battery case chips, do not disturb the battery case chips and soil, and immediately call the Illinois EPA, Bureau of Land, or the Madison County Planning and Development Department, Madison County Recycling (the telephone numbers are listed below) for help.

Battery case chips, or excavated soil containing battery case chips, cannot be used as fill material at any other property or disposed at any other location except in an approved, licensed disposal facility. After the battery case chips and soil have been removed, the excavated area should be filled with clean, uncontaminated soil, followed by ground cover (sod, gravel, asphalt, or concrete).

SITE DESCRIPTION AND HISTORY

NL Industries operated a lead smelting and recycling plant at 16th Street and Cleveland Boulevard in Granite City, Illinois, from 1903 until 1983. From the 1950's forward, the plant also recycled lead-acid batteries. According to the U.S. Environmental Protection Agency (EPA), airborne lead particles from the smelter contaminated some properties in Granite City, Madison, and Venice, and impacted other properties where lead-contaminated, battery case chips were used to fill low-lying areas. From 1993 to 2000, the U.S. Army Corps of Engineers, EPA, and private companies performed a cleanup at the plant and surrounding properties. Under EPA's approved cleanup plan, some properties may still contain lead-contaminated soil and/or battery case chips. This information sheet is to notify you that the property you plan to dig or excavate may be one of those properties and may contain lead-contaminated soil or battery case chips.

LEAD USE AND POTENTIAL HAZARDS

Lead is also a naturally occurring element. It is a relatively soft, naturally occurring metal that can be found almost anywhere. Much of the lead in the environment comes from human activities including burning fossil fuels (for example, coal-fired power plants and gasoline in automobiles), mining, and manufacturing. Lead was used in many materials and products (such as lead paint, lead solder, etc.) before the potential health risks were discovered. Lead can be found at home, at schools and childcare facilities, in products, in drinking water, in outdoor air and soil. Lead was the main ingredient in the batteries that were recycled by NL Industries at the Granite City plant.

Adverse health effects can be associated with lead exposure and elevated levels of lead in the blood, particularly in children under six years of age. You can get more information about the hazards and potential health effects of lead by contacting the Madison County Lead Program at:

Madison County Community Development
130 Hillsboro Avenue, Edwardsville, IL 62025
Telephone: (618) 692-8940
<http://www.co.madison.il.us>

ADDITIONAL INFORMATION

This sheet is intended to provide basic information about your plans to dig or excavate into soil or fill materials that may contain lead. More detailed information is available on the Internet:

- Information about the NL Industries, Inc./Taracorp Superfund Site (U.S. Environmental Protection Agency):
<http://www.epa.gov/region5/cleanup/nltaracorp/>
- Information about lead and potential lead hazards:
 - U.S. Environmental Protection Agency (EPA): <http://www.epa.gov/lead>
 - Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov/lead/>
- Information about soil/battery case disposal:
 - Illinois EPA, Bureau of Land, telephone: (217) 782-6761; ask for the NL/Taracorp Site Project Manager.
- Information about Madison County's lead program (Madison County Community Development):
 - Telephone: (618) 692-8940
 - Internet: http://www.co.madison.il.us/CommunityDevelopment/CommunityDevelopment_LeadBasedPaint.shtml
- Madison County Planning and Development Department, Madison County Recycling:
 - Telephone: (618) 296-6647
 - Internet: <http://www.madisoncountyclecyles.com/#>
- United States Environmental Protection Agency, Region 5; Attention Sheri Bianchin, Remedial Project Manager, NL/Taracorp Superfund Site (Granite City, IL)
 - Telephone: (312) 886-4745 or (800) 621-8431; Email: Bianchin.Sheri@epamail.epa.gov
- NL Industries/Taracorp Superfund Site Group, Attention Jeffrey A. Leed; Site Coordinator/Project Manager
 - Telephone: (877) 670-7310; Email: jleed@leedenvironmental.com

Appendix I

Groundwater Monitoring Results

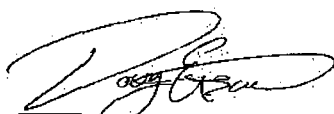
**NL Industries/Taracorp Superfund
Site Group**

**Five-Year Review Groundwater
Monitoring Report**

**NL Industries/Taracorp Superfund Site
Granite City, Illinois**

February 2009

ARCADIS



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**Five-Year Review Groundwater
Monitoring Report**

NL Industries/Taracorp Site
Granite City, Illinois

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February 27, 2009

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1 Introduction

This Five-Year Review Groundwater Monitoring Report has been prepared by ARCADIS U.S., Inc. (ARCADIS) on behalf of the NL Industries/Taracorp Superfund Site Group (Site Group) to present the results of groundwater monitoring conducted in January 2009 at the NL Industries, Inc./Taracorp Superfund Site (Site) located in Granite City, Illinois (**Figure 1**). This groundwater monitoring event was conducted in conjunction with the United States Environmental Protection Agency's (U.S. EPA's) five-year review of the remedy that has been implemented at the Site.

The January 2009 five-year review groundwater monitoring event was conducted by ARCADIS in accordance with the *Scope of Work for Groundwater Monitoring for the Five-Year Review, NL Industries/Taracorp Superfund Site, Granite City, Illinois, Revised December 2008 (Scope of Work)* that was prepared by the Site Group and approved by the U.S. EPA in November 2008. The Scope of Work was approved with modifications by U.S. EPA in a letter dated November 28, 2008 from Ms. Sheri L. Bianchin, the U.S. EPA Remedial Project Manager, to Mr. Jeff Leed of Leed Environmental, Inc., the Project Coordinator for the Site Group. Copies of the U.S. EPA's November 28, 2008 approval letter and the Site Group's December 10, 2008 response letter that includes written responses to U.S. EPA's comments on the SOW are provided in **Appendix A** of this report.

The following discussion on the site background has been excerpted from the *Scope of Work for Groundwater Monitoring for the Five-Year Review, NL Industries/Taracorp Superfund Site, Granite City, Illinois* (Leed Environmental, Inc. 2008) and is presented here to provide a summary of the groundwater remedial activities that have been completed at the Site to date by the Site Group.

2 Site Background

2.1 Site History

The NL Industries/Taracorp Superfund Site is the location of a former lead-acid battery breaking and secondary lead smelting facility in Granite City, Illinois. Metal refining, fabricating, and associated activities were conducted at the Site since before the turn of the century with secondary lead smelting conducted since 1903. Operations ceased at the Site in 1983. As a result of these historical operations a few metal compounds, including cadmium, lead, and zinc have been detected in groundwater in the former

lead-acid battery breaking area. The Site was added to the National Priorities List (NPL) in 1986.

2.2 Previous Groundwater Sampling Activities

The Site Group installed additional monitoring wells and conducted a Pre-Design groundwater investigation at the Site in 2000. Based on its review of the results of the 2000 Pre-Design groundwater investigation, U.S. EPA concluded that:

- The extent of groundwater contamination at the Site was very limited;
- The extent of groundwater contamination would likely decrease even further in the future;
- There was no legitimate reason to require installation of a groundwater containment system at the Site; and
- The groundwater remedy for the Site would consist of additional groundwater monitoring, with development of a contingency plan to address any exceedances of groundwater standards in the event they occur outside of the perimeter monitoring wells.

Based on the results of the Pre-Design Investigation, summarized above, which confirmed the limited extent of groundwater impacts at the Site, it was recommended that the groundwater remedy specified in the Consent Decree be modified to consist of groundwater monitoring only. Accordingly, groundwater monitoring was selected as the final groundwater remedy for the Site in the Explanation of Significant Differences (ESD) issued by the U.S. EPA on September 9, 2000.

The Group submitted a Groundwater Monitoring Plan to U.S. EPA in December 2000 (ARCADIS, 2000) and, following receipt of U.S. EPA's approval in August 2001, submitted additional information in 2001 and subsequently conducted annual groundwater monitoring events in 2001, 2002, and 2003.

Following completion of the 2003 annual groundwater monitoring event, the Site Group submitted a letter to the U.S. EPA in August 2003 which recommended that:

- Future groundwater monitoring should be limited to the monitoring wells within the property boundaries of the Main Industrial Site;

- Off-site downgradient monitoring wells installed at the Granite City Steel facility and the Terminal Railroad of St. Louis property should no longer be sampled as part of the future monitoring program; and
- The remote fill area monitoring wells in Venice Township and Eagle Park Acres should also be eliminated from the future monitoring program.

The U.S. EPA approved these recommendations and determined further, that groundwater monitoring for the seventeen (17) wells located at the Main Industrial Site should be conducted once every five years in conjunction with U.S. EPA's five-year review of the groundwater remedy at the Site.

The purpose of this report is to report on the results of the groundwater monitoring event performed by the Site Group in January 2009 in conjunction with U.S. EPA's 2008-2009 five-year review of the groundwater monitoring remedy.

3 Field Investigations

The following field investigations were conducted as part of the five-year review groundwater monitoring event:

- Site visit and assessment of condition of seventeen (17) existing monitoring wells that are included in the monitoring well network for the groundwater monitoring program at the Site (December 18, 2008-);
- Redevelopment of sixteen (16) of the existing monitoring wells to remove sediments that had accumulated in the wells since the last groundwater monitoring event conducted in 2003. Monitoring Well GMMW-103R was damaged and could not be redeveloped or sampled as part of this groundwater monitoring event (January 6 - January 8, 2009);
- Groundwater sampling (January 9 - January 13, 2009);
- Collection of a leachate sample for laboratory analysis from the leachate collection sump within the closed Taracorp pile (January 13, 2009); and
- Discharge of containerized well development water and leachate from the leachate collection sump to the municipal sanitary sewer system under authorization from the Granite City Regional Wastewater Treatment Plant (February 2, 2009).

The field investigations were performed in accordance with the procedures specified in the SOW and the *Groundwater Monitoring Plan, NL/Taracorp Superfund Site, Granite*

City, Illinois (ARCADIS, 2001). Specifically, groundwater sampling field protocols (including sounding the monitoring wells, measuring the water levels, purging the wells, field analysis, and groundwater sampling) followed the procedures outlined in the SOW and described in Section 3.0 of the *Groundwater Monitoring Plan*, with the following exception. Air-lift methods were not used to redevelop the groundwater monitoring wells sampled during the five-year review groundwater monitoring event. The monitoring wells were redeveloped by surging and over pumping with either a Grundfos Redi-Flo2 two-inch diameter electrical submersible pump, or a Waterra mechanical lift pump equipped with a surge block.

A list of the monitoring wells that were sampled as part of the five-year review groundwater monitoring event is presented in **Table 1**. The locations of the monitoring wells are shown on **Figure 2**.

3.1 Monitoring Well Assessment and Redevelopment

On January 5, 2009, ARCADIS conducted an initial site reconnaissance and monitoring well assessment by locating and identifying each of the seventeen (17) monitoring wells at the Main Industrial Site that have been designated for inclusion in the monitoring well network for the Site. The condition of the protective surface casing and surface seal at each monitoring well location was inspected to determine if the integrity of the surface seal had been compromised. Based on the initial well assessment, Monitoring Well GMMW-103R was found to be damaged beyond repair. Consequently, Monitoring Well GMMW-103R was not redeveloped or sampled as part of this groundwater monitoring event.

On January 6 through January 8, 2009, Monitoring Wells MW-101, MW-104, GMMW-105S, GMMW-105D, GMMW-107S, GMMW-107D, GMMW-108S, GMMW-108D, GMMW-108X, GMMW-109S, GMMW-109D, GMMW-109X, GMMW-112S, GMMW-112D, GMMW-113S, and GMMW-113D were redeveloped by Environmental Restoration, LLC of Fenton, Missouri, under the direction of ARCADIS. Prior to development activities, each well was opened, allowed to equilibrate, and gauged with an electronic water-level meter for depth to groundwater and total depth. Total measured depths were compared to installed depths to determine the amount of sediment that had accumulated in the well since the last groundwater monitoring event in 2003.

Monitoring wells MW-101, MW-104, GMMW-105S, GMMW-105D, GMMW-108S, GMMW-108D, GMMW-108X, GMMW-109S, GMMW-109D, GMMW-109X, GMMW-

112S, GMMW-112D, GMMW-113S, and GMMW-113D were redeveloped with a Grundfos Redi-Flo2 submersible pump. The pump was used as a surge block by moving the pump body along the entire length of screen to increase the velocity of groundwater across the filter pack. Development water was monitored for water quality parameters (i.e., pH, temperature, specific conductivity, turbidity, dissolved oxygen and oxidation/reduction potential) during redevelopment activities with an In-Situ, Inc. Troll Model 9000 multi-channel data logger equipped with a flow-through cell. Groundwater quality parameters collected during redevelopment activities at each of the monitoring wells are provided on Well Development Logs (**Appendix B**).

Monitoring wells GMMW-107S and GMMW-107D were developed with a Waterra mechanical lift pump and surge block due to an accumulation of very fine grained sand inside these two particular wells. The mechanical lift pump was used at these two well locations because of concern that pumping the coarse sand particles through the submersible pump might damage the pump seals and impeller. Water quality parameters could not be collected from MW-107S and MW-107D during redevelopment because the Waterra pump mechanism was not compatible with the In Situ, Inc. Troll 9000 flow-through cell.

A minimum of ten well volumes was removed from each of the monitoring wells during redevelopment. The well development water was containerized in two, 250-gallon poly totes provided by Environmental Restoration, LLC. A grab sample (sample designation "WC-1" in the analytical report for Sample Designation Group 500-16333-1) of the development water was collected and submitted to TestAmerica Laboratories Inc. of University Park, Illinois (project laboratory) for analysis of the list of parameters (pH, metals, mercury, cyanide, phenols, oil & grease, total suspended solids, and 5-Day biological oxygen demand) required by the Granite City Regional Wastewater Treatment Plant (GCRWWTP) prior to authorization for discharge to the municipal sanitary sewer system. ARCADIS also collected a grab sample of leachate from the collection sump (sample designation "Sump" in the analytical report for Sample Designation Group 500-16542-1) within the Taracorp pile and submitted the leachate sample to TestAmerica Laboratories Inc. for analysis. A copy of the project laboratory Report of Results for the analysis of the well development water and leachate is provided in **Appendix C**.

Because of the freezing temperatures, the two, 250-gallon totes containing the well development water were temporarily stored inside at Environmental Restoration's facility in Fenton, Missouri, pending receipt of the waste characterization sampling results from the project laboratory. Following receipt of the sample analysis,

ARCADIS submitted the required Self Monitoring Report and a copy of the laboratory analytical results to the GCRWWTP for approval of the discharge of the well development water and the leachate from the collection sump within the Taracorp pile to the municipal sanitary sewer system (Tokarski, pers. comm. 2009). A copy of the correspondence and supporting documentation submitted by ARCADIS to the GCRWWTP is provided in **Appendix C**.

All sample results were below the applicable pre-treatment sewer use standards for discharge to the GCRWWTP. On February 2, 2009, Mr. Vince Starko, General Foreman for Operations at the GCRWWTP, issued a letter authorizing discharge of the well development water to the municipal sanitary sewer system (Starko, pers. comm. 2009). A copy of the GCRWWTP's letter authorizing discharge to the sanitary sewer system is provided in **Appendix C**. On February 2, 2009, following receipt of the letter authorization, Environmental Restoration, LLC discharged the well development water and the leachate from the collection sump within the Taracorp pile to the sanitary sewer manhole at 15th and State Streets as directed by the GCRWWTP.

3.2 Water Level Measurements

Depth to groundwater measurements were obtained from each monitoring well prior to groundwater sampling. A depth to groundwater measurement could not be collected from Monitoring Well GMMW-103R because it was damaged. Water levels were measured with an electronic water-level indicator to the nearest 0.01 ft. The water levels were referenced to the top of the inner well casing. A water table contour map generated from the water level data collected during the January 2009 monitoring event is presented on **Figure 3**. The groundwater elevation data are presented in **Table 2**. The groundwater flow direction during the January 2009 monitoring event was generally to the south-southwest with an average estimated horizontal hydraulic gradient of 0.001 ft/ft.

3.3 Groundwater Sampling

Groundwater samples were collected with a QED Micro Purge submersible bladder pump using the low flow sampling procedures described in the *Groundwater Monitoring Plan* in order to minimize the turbidity of the groundwater samples.

Prior to sampling, each monitoring wells was purged of standing water within the well casing using the low-flow submersible bladder pump. During well purging, field measurements of groundwater pH, turbidity, temperature, conductivity, dissolved

oxygen and oxidation-reduction potential (ORP) were made with an In-Situ, Inc. Troll Model 9000 multi-channel data logger equipped with a flow-through cell. Purging at each well was continued until measurements of the field parameters had stabilized. Field parameter measurements during well purging were recorded on Groundwater Sampling Logs, which are provided in **Appendix D**.

Once the field parameters had stabilized, the groundwater samples were transferred directly from the low-flow sampling pump to the sample container. Following sample collection, the containers were labeled, placed in an iced cooler, and submitted to the project laboratory for analysis of cadmium, lead and zinc under standard chain-of-custody procedures to document sample possession and transfer to the laboratory. Groundwater samples were analyzed by the project laboratory using U.S. EPA Method 6010 (Test Methods for Evaluating Solid Waste, SW-846, Third Edition).

3.4 Quality Control Samples

The field and laboratory quality control (QC) program for the five-year review groundwater monitoring event included collection of two (2) field duplicate samples and two (2) laboratory matrix spike/matrix spike duplicate (MS/MSD) samples for analysis by the project laboratory.

4 Results of Chemical Analyses

4.1 Groundwater Results

Laboratory results for all groundwater samples collected from the NL Industries/Taracorp Site as part of the five-year review groundwater monitoring event are summarized in Table 3. For comparison purposes, historical groundwater analytical data (March 2000, April 2000, December 2001, July 2002, and March 2003) are also presented in Table 3. Copies of the project laboratory analytical data reports for this event are provided in **Appendix E**. Analytical results for the groundwater samples are reported in milligrams per liter (mg/L), or parts per million (ppm).

The analytical results for the 2009 groundwater monitoring event are presented in Table 3. The concentrations of lead, cadmium and zinc detected in the 2009 groundwater samples are compared to the performance standards for the site, which are the action level of 0.015 mg/L for lead, and the maximum contaminant levels (MCLs) of 0.005 mg/L and 5.0 mg/L for cadmium and zinc, respectively. The action level for lead is exceeded slightly in a single monitoring well (GMMW-107S). The

concentration of lead detected in the groundwater sample (unfiltered) collected from GMMW-107S was 0.021 mg/L.

The only other detections above the performance standards during the 2009 groundwater monitoring event were for cadmium and zinc in monitoring wells GMMW-108S and GMMW-108D (refer to Table 3). Cadmium and zinc have been detected in GMMW-108S and GMMW-108D at concentrations above their respective performance standards in each of the previous groundwater monitoring events. The GMMW-108 well nest is located immediately downgradient from the former battery breaker and the former Taracorp pile. Note that the concentrations of cadmium and zinc detected in these wells during the 2009 groundwater monitoring event declined in comparison with historically reported concentrations.

4.2 Data Validation

The laboratory data for the five-year review groundwater monitoring event consist of ARCADIS Level II deliverables as specified by the *Groundwater Monitoring Plan*. The laboratory data for the groundwater samples were independently reviewed and validated by ARCADIS according to U.S. EPA approved methodologies and data validation guidelines for inorganic parameters, "USEPA National Functional Guidelines for Inorganic Data Review," dated July 2002. The laboratory data for the groundwater samples were reported by the project laboratory in two separate Sample Delivery Groups - Sample Delivery Group (SDG) #500 -16542 and SDG #500 - 16396.

Zinc was detected in the laboratory method blank for both Sample Delivery Groups. Method blanks measure laboratory contamination. The laboratory qualifier (UB) has been added to the sample results for zinc associated with laboratory method blank contamination. The (UB) qualifier denotes that the analyte is considered non-detect at the listed value due to the associated blank contamination. The laboratory qualifiers for the 2009 groundwater monitoring event have been added to the summary of groundwater analytical data presented in Table 3. The data validation for the analytical results for cadmium and lead concluded that the data were found to be of acceptable quality and no data qualifications were required. The ARCADIS data quality assessments for SDG #500-16542 and SDG #500-16396 are presented in

Appendix E.

5 Summary of Findings

The following findings can be made based on the field observations and laboratory data obtained during the 2009 five-year review groundwater monitoring event at the NL Industries/Taracorp Superfund Site.

- Historical groundwater elevation data collected by ARCADIS during the remedial design indicated a south-southwesterly flow direction in the surficial aquifer. Groundwater elevation data collected during the present investigation showed a similar flow pattern (see Figure 3).
- The groundwater performance standards for cadmium and zinc were only exceeded in Monitoring Well GMMW-108S and Monitoring Well GMMW-108D, located immediately downgradient from the former battery breaker. Cadmium and zinc have been detected in GMMW-108S and GMMW-108D at concentrations above their respective performance standards in each of the previous groundwater monitoring events. The presence of cadmium and zinc at concentrations above the groundwater performance standards in these two wells is attributable to their proximity to the former source area. The concentrations of cadmium and zinc in further downgradient Monitoring Well MW-104, Monitoring Well Nest GMMW-109, and Monitoring Well Nest GMMW-112 remain below their respective groundwater action levels indicating that these constituents are not mobile in groundwater and have not migrated offsite.
- Lead was detected in the groundwater at a concentration slightly above the action level at Monitoring Well GMMW-107S. The presence of lead in GMMW-107S is believed to be attributable to the presence of suspended solids in the sample and is not considered to be attributable to the former source area at the NL Industries/Taracorp site. Based on the groundwater elevation data collected during this groundwater monitoring event, as depicted on Figure 3 (Water Table Contour Map), GMMW-107S is located side gradient of the former Taracorp pile and is not located along the downgradient groundwater flow path originating from the former source area. In addition, as discussed in Section 3.1 (Monitoring Well Assessment and Redevelopment) of this report, the groundwater in Monitoring Well GMMW-107S was particularly turbid.

Based on these findings, it is concluded that the concentrations of cadmium and zinc that have been detected in monitoring wells in the former source area at the Main Industrial Site are not mobile in groundwater and have not migrated further downgradient, and that the detected concentration of lead in Monitoring Well GMMW-

107S is not attributable to the former source area based on groundwater flow direction, and is likely the result of turbidity in the sample.

6 Recommendations

It is recommended that Monitoring Well GMMW-103R be abandoned in accordance with the State of Illinois well abandonment procedures. During the site reconnaissance and monitoring well assessment conducted during this groundwater monitoring event, Monitoring Well GMMW-103R was found to be damaged beyond repair. Replacement of this well is not recommended given the presence of existing Monitoring Well Nest GMMW-112, which is located downgradient of the former source area and directly upgradient of the GMMW-103R well location (Figure 3). Monitoring Well Nest GMMW-112 is positioned to adequately detect any changes in groundwater quality downgradient of the former source area.

7 References

- ARCADIS G&M, Inc. 2000. Pre-Design Investigation Report for Groundwater, NL Industries/Taracorp Superfund Site, Granite City, Illinois, September 2000.
- ARCADIS G&M, Inc. 2000. Groundwater Monitoring Plan, NL Industries/Taracorp Superfund Site, Granite City, Illinois, December 2000.
- NL Industries/Taracorp Superfund Site Group. 2008. Scope of Work for Groundwater Monitoring for the Five-Year Review, NL Industries/Taracorp Superfund Site, Granite City, Illinois, Revised December 2008.
- Starko, V. 2009. Granite City Regional Wastewater Treatment Plant. Letter to Robert Hite, Environmental Restoration, LLC, February 2, 2009.
- Tokarski, A. 2009. ARCADIS U.S., Inc. Letter to Granite City Regional Wastewater Treatment Plant, January 29, 2009.

Table 1. List of Monitoring Wells,
 Five-Year Review Groundwater Monitoring Event,
 NL Industries/Taracorp Superfund Site, Granite City, Illinois.

Property Owner	Monitoring Wells
Metalico of Illinois, Inc.	MW-101
	MW-104
	GMMW-105S
	GMMW-105D
	GMMW-107S
	GMMW-107D
	GMMW-108S
	GMMW-108D
	GMMW-108X
Mr. Scott Oney, State Street Warehouse	GMMW-103R
	GMMW-109S
	GMMW-109D
	GMMW-109X
	GMMW-112S
	GMMW-112D
Mr. John G. Obucina	GMMW-113S
	GMMW-113D

Table 2. Monitoring Well Construction and Groundwater Elevation Data,
NL Industries/Taracorp Site, Granite City, Illinois.

Well Identification	Riser Elevation ¹ (feet/NAVD)	Well Diameter (inches)	Screen Material/ Construction	Screen Length (ft)	Screen Interval (ft bls)	January 2009			
						Well Depth ² (ft bls)	Depth to Groundwater ² (ft bls)	Total Depth (ft bls)	Groundwater Elevation (feet/NAVD)
MW-101	421.17	2.0	Type A	10.0	15.0-25.0	25.0	17.34	26.31	403.83
GMMW-103R	417.18	2.0	Type B	10.0	13.0-23.0	23.0	--	--	--
MW-104	421.21	2.0	Type A	10.0	17.0-27.0	27.0	18.85	29.02	402.36
GMMW-105S	428.46	2.0	Type A	5.0	21.0-26.0	26.0	25.47	28.9	402.99
GMMW-105D	428.45	2.0	Type A	5.0	30.3-35.3	35.3	25.48	39.05	402.97
GMMW-107S	420.66	2.0	Type A	5.0	17.46-22.46	22.46	14.29	24.44	406.37
GMMW-107D	421.57	2.0	Type A	5.0	30.44-35.44	35.44	18.46	38.44	403.11
GMMW-108S	422.27	2.0	Type B	10.0	19.0-29.0	29.0	19.31	31.62	402.96
GMMW-108D	422.71 *	2.0	Type A	5.0	27.26-32.26	32.26	18.69	33.91	404.02
GMMW-108X	422.55	2.0	Type B	10.0	40.0-50.0	50.0	19.80	52.54	402.75
GMMW-109S	418.48	2.0	Type B	10.0	14.0-24.0	24.0	16.01	26.65	402.47
GMMW-109D	418.50	2.0	Type B	10.0	26.5-36.5	36.5	15.96	38.11	402.54
GMMW-109X	418.47	2.0	Type B	10.0	40.0-50.0	50.0	15.97	52.32	402.50
GMMW-112S	416.44	2.0	Type B	10.0	11.0-21.0	21.0	13.8	23.4	402.64
GMMW-112D	416.46	2.0	Type B	10.0	27.5-37.5	37.5	13.82	39.96	402.64
GMMW-113S	413.60	2.0	Type B	10.0	12.0-22.0	22.0	11.18	21.71	402.42
GMMW-113D	413.47	2.0	Type B	10.0	27.5-37.5	37.5	11.09	37.2	402.38

Notes:

¹ Survey conducted by Juneau Associates of Granite City, Illinois on July 25, 2002.

² Total depth and depth to groundwater measurements presented as feet below north side, top of casing.

*Source: "Supplemental Groundwater Investigation" Woodward-Clyde Consultants, November 1993.

All screen material is Polyvinyl chloride (PVC).

Type A screen material is Schedule 40 PVC with 0.010 inch slot size.

Type B screen material is Vee-Pak (pre-sand packed) Schedule 40 PVC with 0.008 inch slot size.

Table 3. Summary of Historical and January 2009 Groundwater Analytical Results, NL Industries/Taracorp Superfund Site, Granite City, Illinois.

Well Designation	Sample Date	Analytical Parameters		
		Cadmium	Lead	Zinc
USEPA MCLs		0.005	--	5
USEPA Action Level		--	0.015	--
MW-101	03/22/00	<0.005	0.0056	<0.02
	04/11/00	<0.005	<0.005	<0.02
	04/11/00	<0.005	<0.005	<0.02
	12/11/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
	01/12/09	0.00062 J	<0.0050	0.02 UB
GMMW-102	03/22/00	<0.005	0.0076	<0.02
	04/11/00	<0.005	<0.005	<0.02
	12/11/01	<0.005	<0.005	<0.02
	07/24/02	<0.005	<0.005	<0.02
	03/25/03	<0.005	0.0057	<0.02
GMMW-103R	03/20/00	<0.005	<0.005	<0.02
	04/10/00	<0.005	<0.005	<0.02
	12/11/01	<0.005	<0.005	<0.02
	07/24/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
	01/08/09	NS ¹	NS ¹	NS ¹
MW-104	03/22/00	<0.005	0.025	0.028
	04/12/00	<0.005	<0.005	<0.02
	12/13/01	<0.005	<0.005	<0.02
	07/24/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	0.0067	<0.02
	01/12/09	<0.0020	0.013	0.02 UB
GMMW-105D	03/21/00	<0.005	0.09	0.024
	04/11/00	<0.005	0.0051	<0.02
	12/13/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	0.0052	<0.02
	01/08/09	<0.0020	0.0067	0.02 UB
GMMW-105S	03/21/00	NS ²	NS ²	NS ²
	04/11/00	NS ²	NS ²	NS ²
	12/13/01	NS ²	NS ²	NS ²
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
	01/08/09	<0.0020	0.013	0.02 UB
GMMW-106D	03/21/00	<0.005	<0.005	<0.02
	04/11/00	<0.005	<0.005	<0.02
	12/13/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
GMMW-106S	07/25/02	<0.005	0.02	<0.02
GMMW-107S	03/22/00	<0.005	0.0085	0.03
	04/11/00	<0.005	<0.005	<0.02
	12/13/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
	01/09/09	<0.0020	0.021	0.021 UB
GMMW-107D	03/22/00	<0.005	0.041	0.056
	04/11/00	<0.005	0.03	0.17
	12/13/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02
	01/09/09	<0.0020	0.013	0.027 UB
	01/09/09	<0.0020	0.013	0.032 UB
USEPA MCLs		0.005	--	5
USEPA Action Level		--	0.015	--
GMMW-108S	03/21/00	4.3	<0.005	21
	04/11/00	4.7	<0.005	27
	12/12/01	2.3	<0.005	14
	07/25/02	1.9	<0.005	11
	03/27/03	2.2	<0.005	14
	01/09/09	1	0.0048 J	9.7
GMMW-108D	03/21/00	6.4	0.0069	35
	04/11/00	6.1	<0.01	35
	12/12/01	6.9	<0.01	32
	07/25/02	6	<0.01	31
	03/27/03	6.6	<0.005	33
	01/09/09	2.2	0.0058	12
GMMW-108X	03/21/00	<0.005	<0.005 J	<0.02
	03/21/00	0.0059	0.02 J	0.06
	04/11/00	0.01	0.014	0.065
	12/12/01	<0.005	<0.005	0.047
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/09/09	0.0015 J	0.012	0.02 UB
GMMW-109S	03/21/00	<0.005	<0.005	<0.02
	04/10/00	<0.005	<0.005	<0.02
	12/10/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/12/09	<0.0020	<0.0050	0.02 UB
GMMW-109D	03/21/00	<0.005	<0.005	<0.02
	04/10/00	<0.005	<0.005	<0.02
	12/10/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/12/09	<0.002	<0.005	0.02 UB
GMMW-109X	03/21/00	<0.005	0.013	0.042
	04/10/00	<0.005	<0.005	<0.02
	12/10/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/12/09	<0.002	0.0026 J	0.02 UB
GMMW-112S	03/20/00	<0.005	<0.005	<0.02
	04/10/00	<0.005	<0.005	<0.02
	12/10/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/13/09	0.00054 J	<0.005	0.02 UB
	01/13/09	0.00063 J	<0.005	0.021 UB
GMMW-112D	03/20/00	<0.005	<0.005	<0.02
	04/10/00	<0.005	<0.005	<0.02
	12/10/01	<0.005	<0.005	<0.02
	07/25/02	<0.005	<0.005	<0.02
	03/27/03	<0.005	<0.005	<0.02
	01/12/09	<0.0020	<0.005	0.02 UB

Table 3. Summary of Historical and January 2009 Groundwater Analytical Results, NL Industries/Taracorp Superfund Site, Granite City, Illinois.

Well Designation	Sample Date	Analytical Parameters			Well Designation	Sample Date	Analytical Parameters		
		Cadmium	Lead	Zinc			Cadmium	Lead	Zinc
USEPA MCLs		0.005	--	5	USEPA MCLs		0.005	--	5
USEPA Action Level		--	0.015	--	USEPA Action Level		--	0.015	--
GMMW-113S	03/22/00	<0.005	<0.005	<0.02	GMMW-121	03/23/00	NA	<0.005	<0.02
	04/11/00	<0.005	<0.005	<0.02		04/12/00	NA	<0.005	NA
	12/11/01	<0.005	<0.005	<0.02		12/12/01	NA	<0.005	NA
	07/24/02	<0.005	<0.005	<0.02		07/24/02	NA	<0.005	NA
	03/25/03	<0.005	<0.005	<0.02		03/25/03	NA	<0.005	NA
	01/13/09	<0.0020	<0.0050	0.02 UB	GMMW-122	03/23/00	NA	<0.005	<0.02
GMMW-113D	03/22/00	<0.005	<0.005	<0.02		04/12/00	NA	<0.005	NA
	04/12/00	<0.005	<0.005	<0.02		12/12/01	NA	<0.005	NA
	12/11/01	<0.005	<0.005	<0.02		07/24/02	NA	<0.005	NA
	07/24/02	<0.005	<0.005	<0.02		03/25/03	NA	<0.005	NA
	03/25/03	<0.005	<0.005	<0.02	GMMW-123	03/22/00	<0.005	<0.005	<0.02
	01/13/09	<0.0020	0.0028 J	0.02 UB		04/12/00	<0.005	<0.005	<0.02
GMMW-115S	05/22/00	<0.0050	<0.0050	NA		12/11/01	<0.005	<0.005	<0.02
	07/26/00	<0.0050	<0.0050	<0.020		07/23/02	<0.005	<0.005	<0.02
	12/11/01	<0.005	<0.005	<0.02		03/25/03	<0.005	<0.005	<0.02
	07/23/02	<0.005	<0.005	<0.02	GMMW-124S	05/22/00	<0.0050	<0.0050	NA
	03/26/03	<0.005	<0.005	<0.02		07/26/00	<0.0050	<0.0050	<0.020
GMMW-115D	07/26/00	<0.0050	<0.0050	<0.020		12/11/01	<0.005	<0.005	<0.02
	12/11/01	<0.005	<0.005	<0.02		07/23/02	<0.005	<0.005	<0.02
	07/23/02	<0.005	<0.005	<0.02		03/26/03	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02	GMMW-124D	05/22/00	<0.0050	<0.0050	NA
						05/22/00	<0.0050	<0.0050	NA
GMMW-116S	05/22/00	<0.0050	<0.0050	NA		07/26/00	<0.0050	<0.0050	<0.020
	07/26/00	<0.0050	<0.0050	<0.020		12/11/01	<0.005	<0.005	<0.02
	12/13/01	<0.005	<0.005	<0.02		07/23/02	<0.005	<0.005	<0.02
	07/23/02	<0.005	<0.005	<0.02		03/26/03	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02	GMMW-125	05/22/00	<0.0050	<0.0050	NA
GMMW-116D	05/22/00	<0.0050	<0.0050	NA		07/26/00	<0.0050	<0.0050	<0.020
	07/26/00	<0.0050	<0.0050	<0.020		12/13/01	<0.005	<0.005	<0.02
	12/13/01	<0.005	<0.005	<0.02		07/23/02	<0.005	<0.005	<0.02
	07/23/02	<0.005	<0.005	<0.02		03/26/03	<0.005	<0.005	<0.02
	03/26/03	<0.005	<0.005	<0.02	GMMW-126	07/26/00	<0.0050	<0.0050	<0.020
GMMW-117	03/23/00	NA	<0.005	<0.02		12/11/01	<0.005	<0.005	<0.02
	04/12/00	NA	<0.005	NA		07/24/02	<0.005	<0.005	<0.02
	12/12/01	NA	<0.005	NA		03/26/03	<0.005	<0.005	<0.02
	07/24/02	NA	<0.005	NA	GMMW-118	03/23/00	NA	<0.005	<0.02
	03/25/03	NA	<0.005	NA		04/12/00	NA	<0.005	NA
GMMW-118	03/23/00	NA	<0.005	<0.02		12/12/01	NA	<0.005	NA
	04/12/00	NA	<0.005	NA		07/24/02	NA	<0.005	NA
	12/12/01	NA	<0.005	NA		03/25/03	NA	<0.005	NA
	07/24/02	NA	<0.005	NA	GMMW-119	03/23/00	NA	<0.005	<0.02
	03/25/03	NA	<0.005	NA		04/12/00	NA	<0.005	NA
GMMW-119	03/23/00	NA	<0.005	<0.02		12/12/01	NA	<0.005	NA
	04/12/00	NA	<0.005	NA		07/24/02	NA	<0.005	NA
	12/12/01	NA	<0.005	NA		03/25/03	NA	<0.005	NA
	07/24/02	NA	<0.005	NA	GMMW-120	03/23/00	NA	<0.005	<0.02
	03/25/03	NA	<0.005	NA		04/12/00	NA	<0.005	NA
GMMW-120	03/23/00	NA	<0.005	<0.02		12/12/01	NA	<0.005	NA
	04/12/00	NA	<0.005	NA		07/24/02	NA	<0.005	NA
	12/12/01	NA	<0.005	NA		03/25/03	NA	<0.005	NA
	07/24/02	NA	<0.005	NA					
	03/25/03	NA	<0.005	NA					

Results are reported in milligrams per liter (mg/L).

Samples collected using low-flow unfiltered methodology.

NA Not analyzed

NS¹ Not sampled - well was damaged

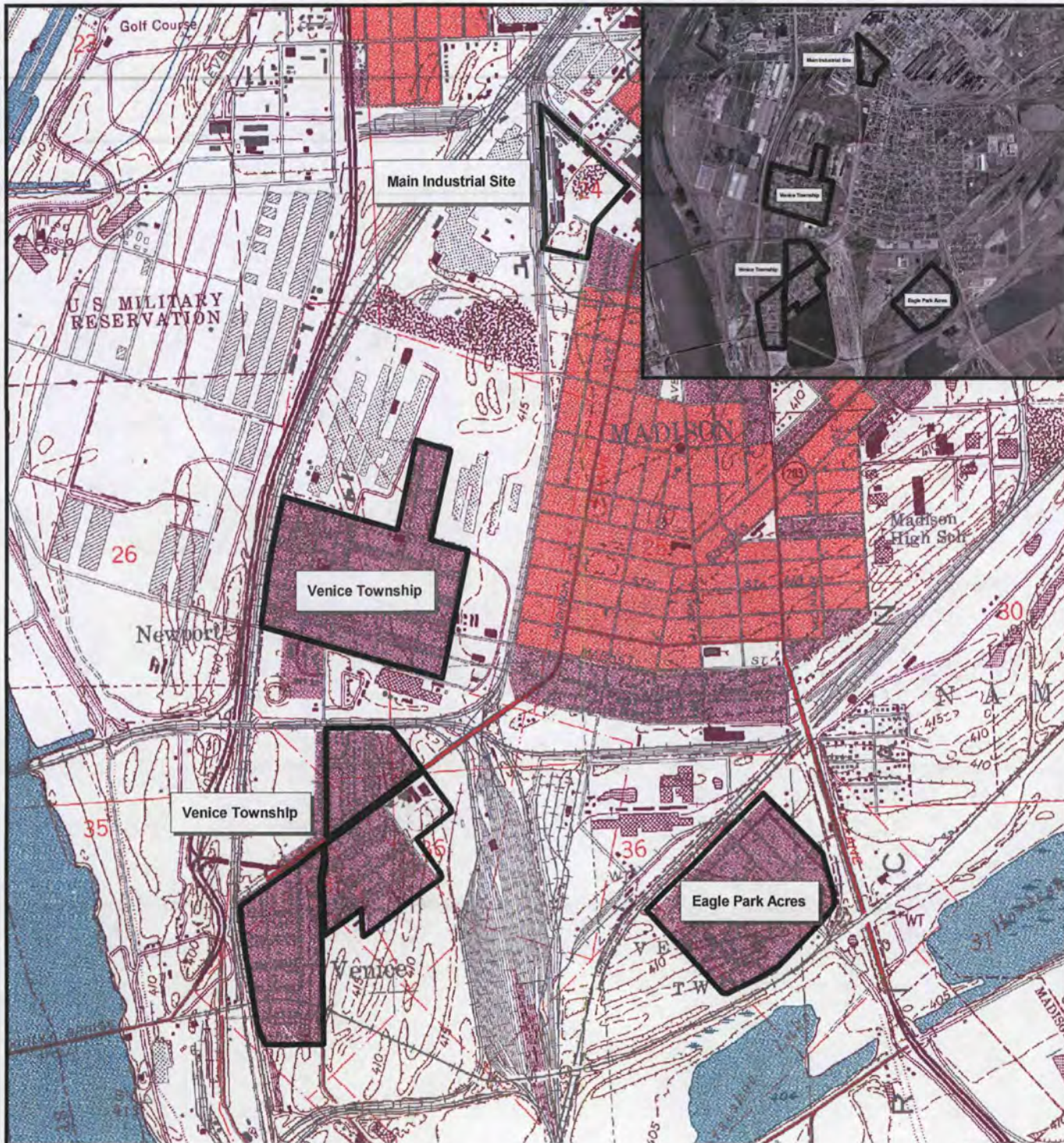
NS² Not sampled - well was dry

Exceeds USEPA Performance Standards. Performance standards for cadmium, lead and zinc are identified in the USEPA approved Contingency Plan to the Groundwater Monitoring Plan (ARCADIS 2000).

B Compound was found in the laboratory blank and sample.

J Result is less than the RL, but greater than or equal to the MDL, and the concentration is an estimated value.

UB Analyte considered non-detect at the listed value due to associated blank contamination



Parcel

2000 0 2000 4000 Feet

Topographical Map Source: United States Geological Survey
7.5 minute Digital Raster Graphics. Quadrangles used:
Granite City, IL-MO; 1993.

Aerial Photo Source: Photographed 1999 by the
National Aerial Photography Program and digitized by the
USGS DOQ Program in 2001.

Illinois



35 East Wacker Drive, Suite 1000
Chicago, IL 60601
Tel (312)263-6703 Fax (312)263-7897

Drawing Date:
09/04/2002

File Name:
nl.apr

File Location:
G:\GIS\Mapping\NL\CI001003.0007\

Drawn By:
M. Eiseman

Checked By:
K. Lala

Project Manager:
J. Kratzmeyer

Dept. Manager:

View:
Site Location
Map

Project Number:
CI001003.0007

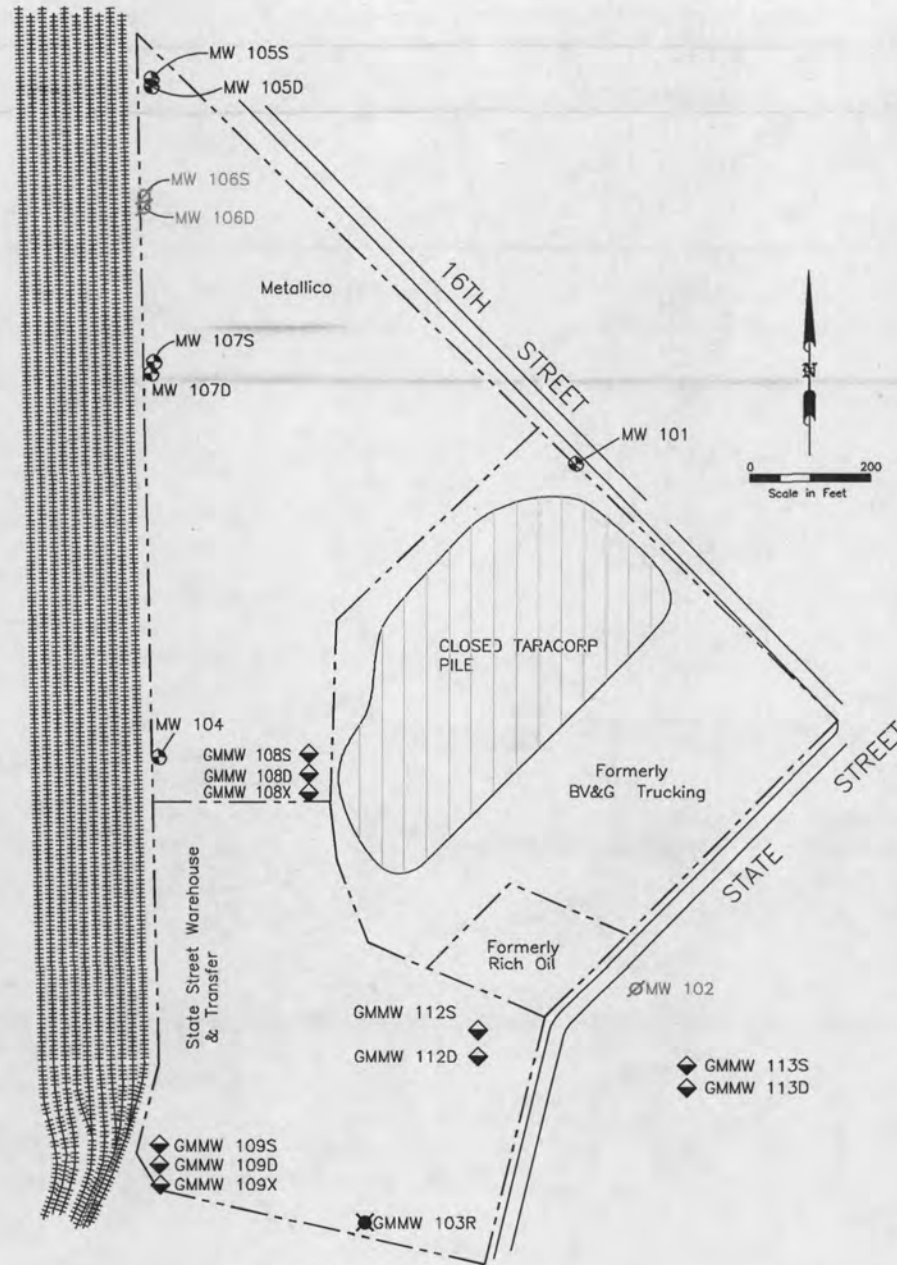
Figure:

1

NL Industries/Taracorp
Superfund Site

Site Location Map

Granite City, Illinois



LEGEND

- MW101 EXISTING MONITORING WELL/IDENTIFICATION
 - - - - - PROPERTY LINE
 + + + + + RAILROAD TRACKS
 GMMW 112S,D MONITORING WELL CLUSTER/IDENTIFICATION (Shallow and Deep depths)
 GMMW 109X DEEPER MONITORING WELL/IDENTIFICATION
 GMMW 103R DAMAGED MONITORING WELL/PROPOSED FOR ABANDONMENT
 MW 106S ABANDONED MONITORING WELL/IDENTIFICATION
 S SHALLOW (12-34 FEET BELOW LAND SURFACE)
 D DEEP (27-44 FEET BELOW LAND SURFACE)
 X DEEPER (40-50 FEET BELOW LAND SURFACE)

Source: Woodward-Clyde Consultants, Figure No.1.

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ARCADIS

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 NL INDUSTRIES/TARACORP SUPERFUND SITE
 MAIN INDUSTRIAL SITE - MONITORING
 WELL LOCATION MAP
 GRANITE CITY, ILLINOIS

 Checked By
 L.CRAVEN

 Drawn BY
 D.ETSCHERD

 Drawing Date
 01/30/09

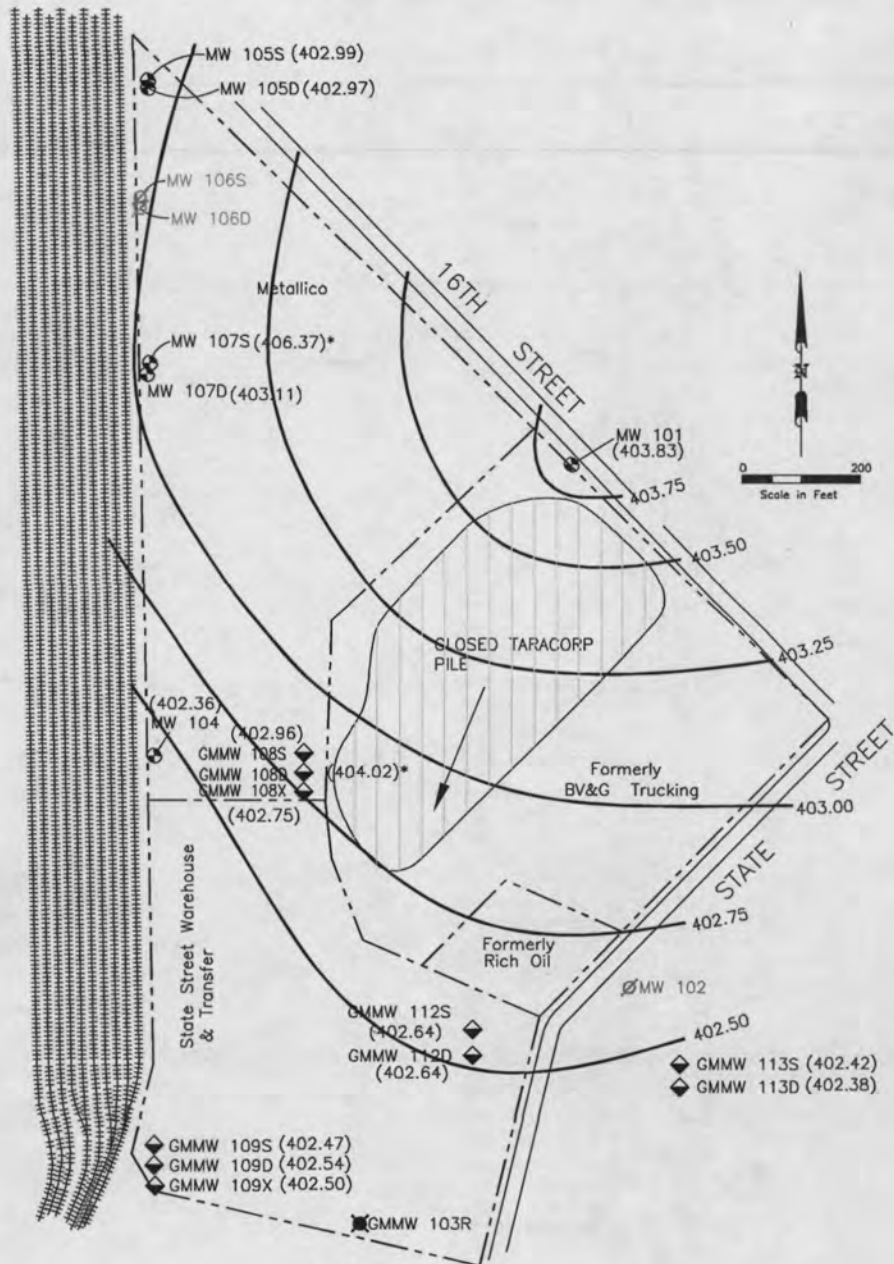
 Project Manager
 J. Kratzmeyer

 File Name
 1-2009 GW FLOW.DWG

 Project Number
 C1001003.0010

 File Location
 G:\PROJECT\NL Industries

 Figure
 2



LEGEND

- MW101 EXISTING MONITORING WELL/IDENTIFICATION
 --- PROPERTY LINE
 +++++ RAILROAD TRACKS
 GMMW 112S,D MONITORING WELL CLUSTER/IDENTIFICATION (Shallow and Deep depths)
 GMMW 109X DEEPER MONITORING WELL/IDENTIFICATION
 GMMW 103R DAMAGED MONITORING WELL/PROPOSED FOR ABANDONMENT
 MW 106S ABANDONED MONITORING WELL/IDENTIFICATION
 S SHALLOW (12-34 FEET BELOW LAND SURFACE)
 D DEEP (27-44 FEET BELOW LAND SURFACE)
 X DEEPER (40-50 FEET BELOW LAND SURFACE)
 (399.64) GROUNDWATER ELEVATION (IN FEET)
 * ELEVATION NOT USED IN CONTOURING
 --- GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
 400.0 GROUNDWATER FLOW DIRECTION

Source: Woodward-Clyde Consultants, Figure No.1, November 11, 1993, Proj. no. C3M11Q.



ARCADIS

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NL INDUSTRIES/TARACORP SUPERFUND SITE
MAIN INDUSTRIAL SITE - GROUNDWATER
ELEVATIONS & CONTOUR MAP - 2009
GRANITE CITY, ILLINOIS

Checked By
LCRAVEN
Drawn BY
D.ETSCHIED

Drawing Date
01/30/09
Project Manager
J. Kratzmeyer

File Name
1-2009 GW FLOW.DWG
Project Number
C1001003.0010

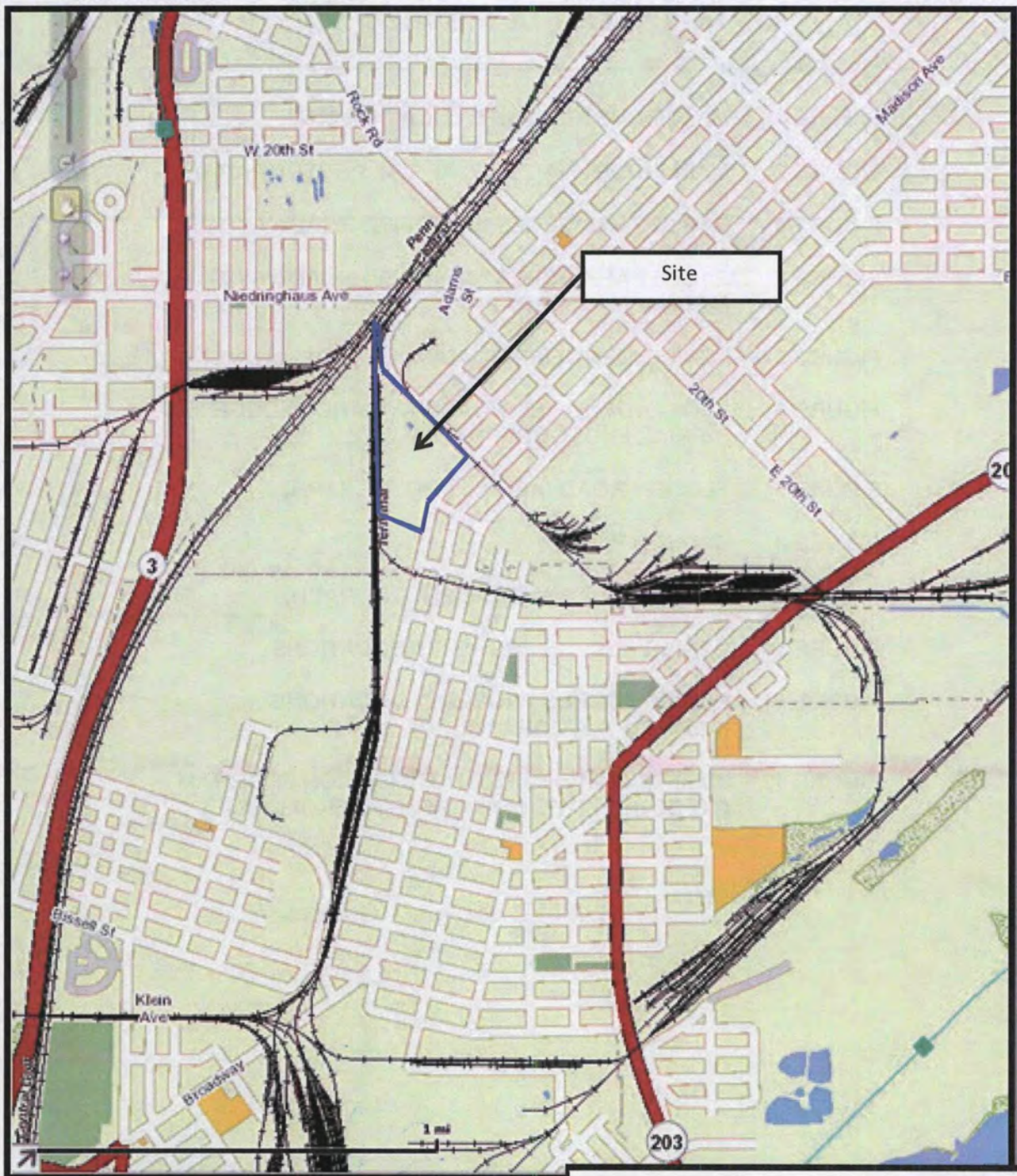
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Figure
3

Appendix J

Maps from the Institutional Controls Work Plan

LIST OF FIGURES

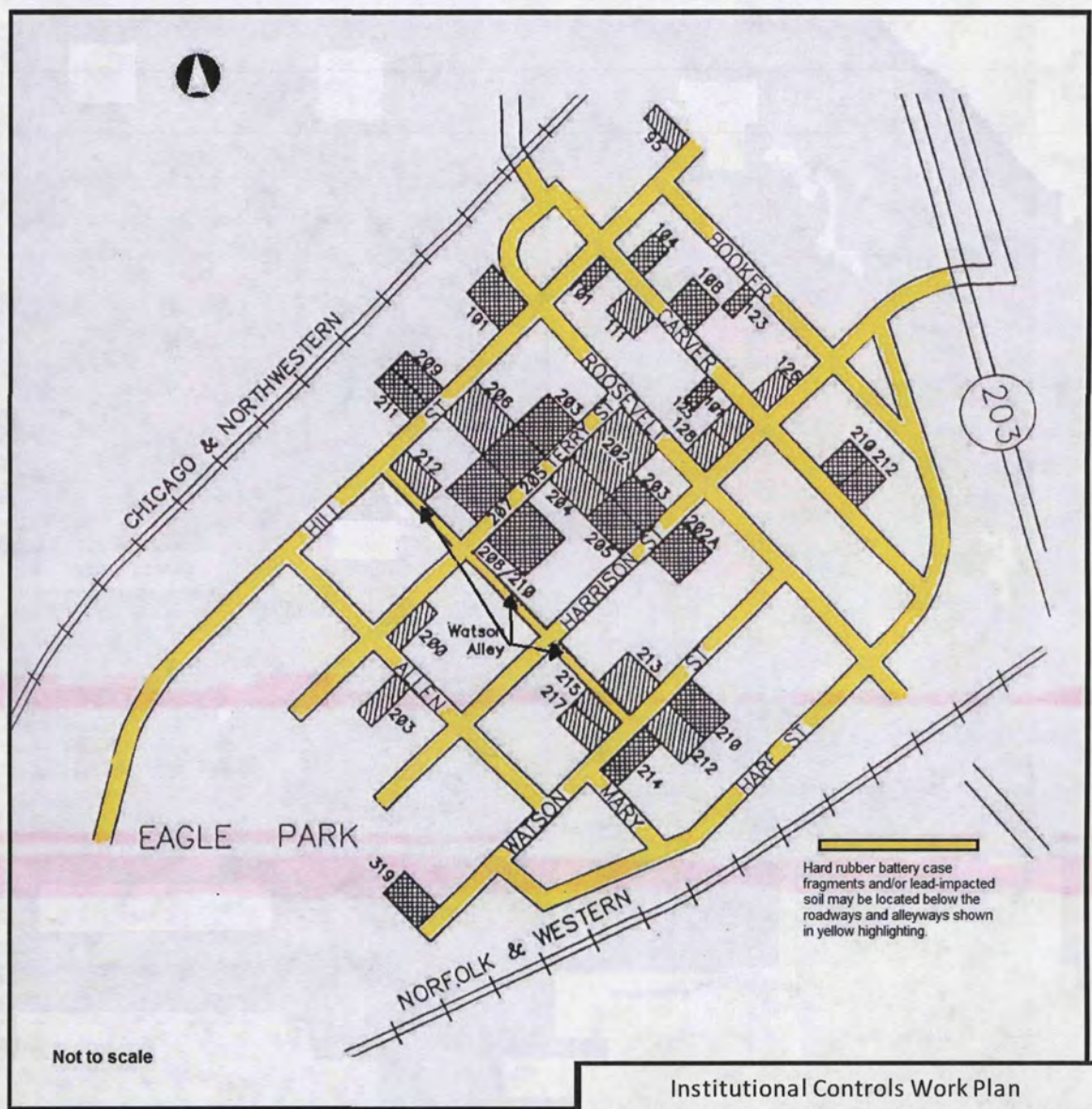
- FIGURE 1 MAIN INDUSTRIAL SITE LOCATION MAP**
- FIGURE 2 MAIN INDUSTRIAL SITE (AERIAL PHOTOGRAPH)**
- FIGURE 3 EAGLE PARK ACRES IDENTIFIED ROADWAYS**
- FIGURE 4 EAGLE PARK ACRES IDENTIFIED ROADWAYS
(AERIAL PHOTOGRAPH)**
- FIGURE 5 VENICE IDENTIFIED ROADWAYS**
- FIGURE 6 VENICE IDENTIFIED ROADWAYS AND SLOUGH ROAD
(AERIAL PHOTOGRAPH)**
- FIGURE 7 SLOUGH ROAD (AERIAL PHOTOGRAPH)**
- FIGURE 8 SLOUGH ROAD**
- FIGURE 9 SLOUGH ROAD (AERIAL PHOTOGRAPH)**
- FIGURE 10 DENIED ACCESS PROPERTY LOCATIONS**
- FIGURE 11 DENIED ACCESS PROPERTY LOCATIONS
(AERIAL PHOTOGRAPH)**
- FIGURE 12 JULIE MAP - ONE-CALL NOTIFICATION PROGRAM
(TO BE INSERTED UPON RECEIPT FROM JULIE)**



Institutional Controls Work Plan
Figure 1 – Main Industrial Site Location Map



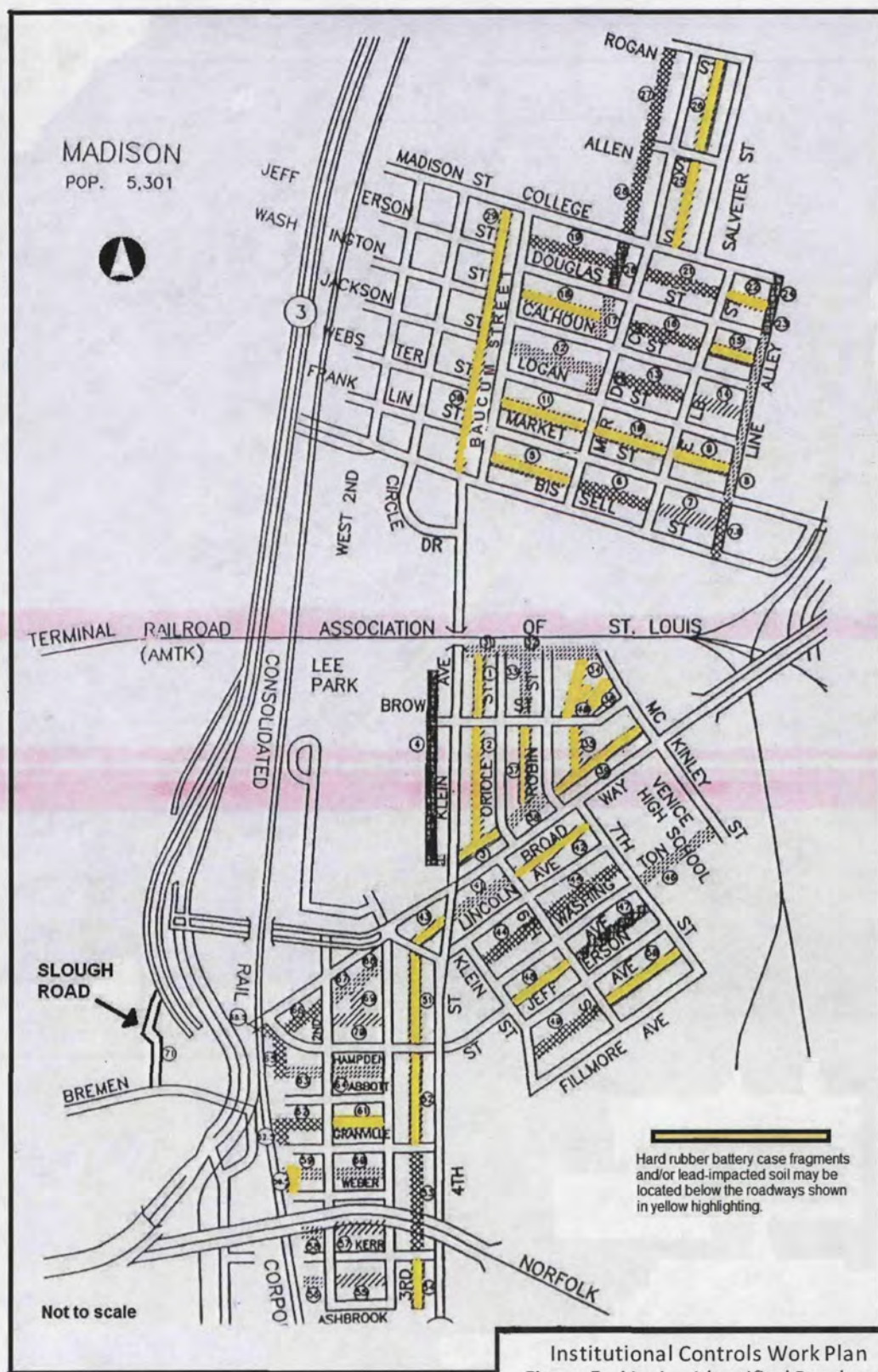
Institutional Controls Work Plan
Figure 2 – Main Industrial Site



Institutional Controls Work Plan
Figure 3 – Eagle Park Acres Identified Roadways

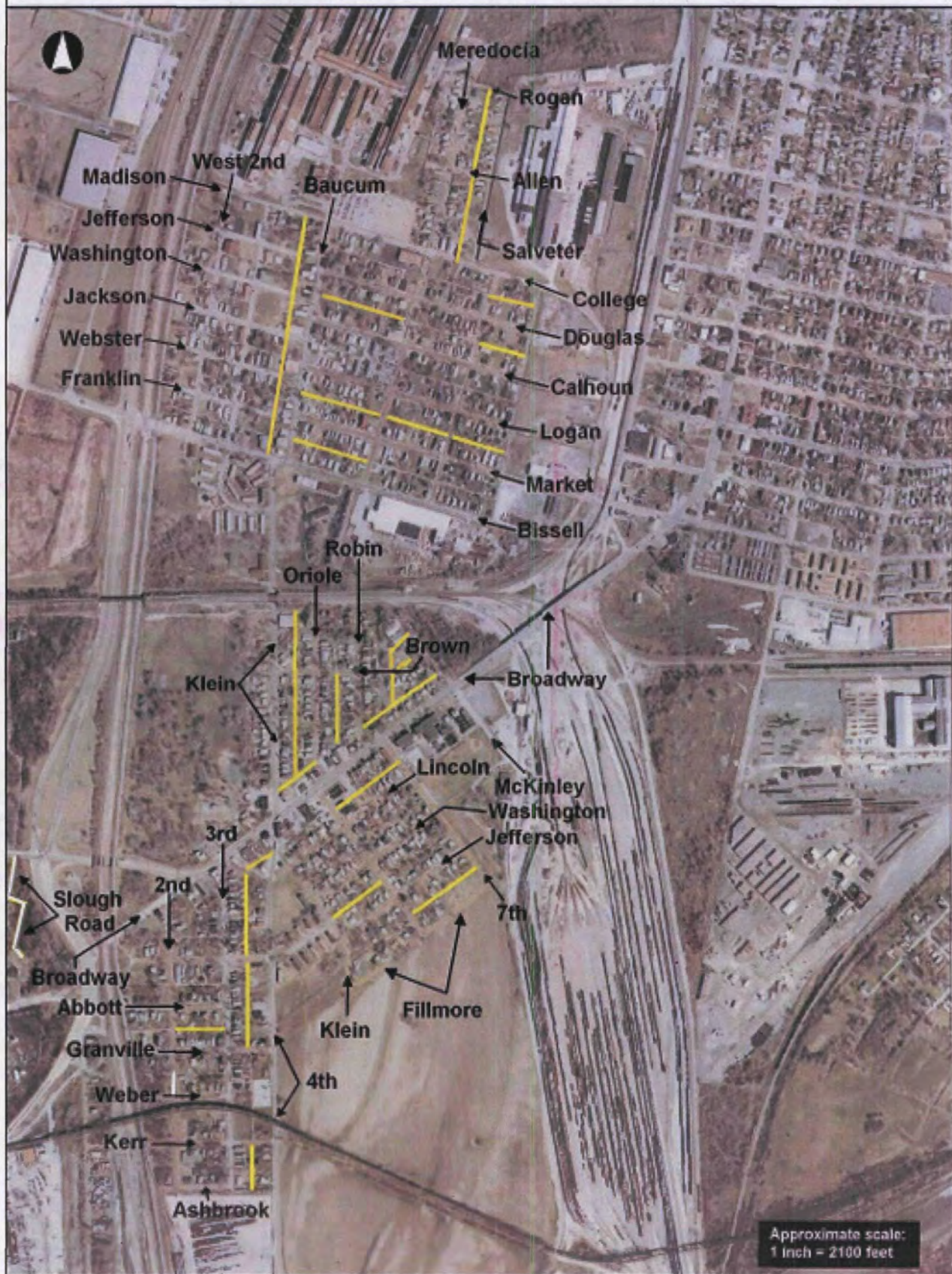


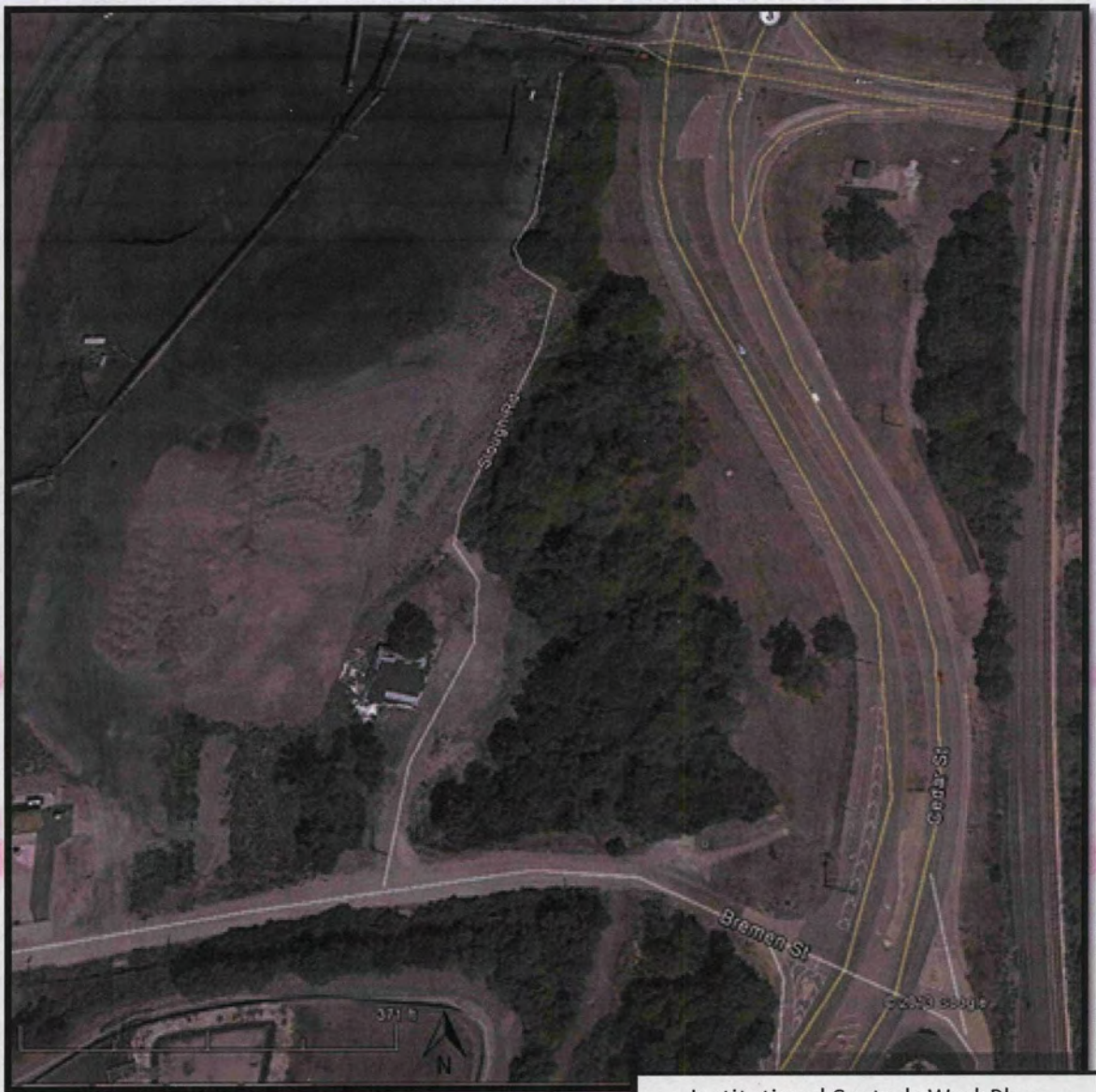
Institutional Controls Work Plan
Figure 4 – Eagle Park Acres Identified Roadways



Institutional Controls Work Plan

Figure 6 - Venice Identified Roadways and Slough Road





Institutional Controls Work Plan
Figure 7 – Slough Road

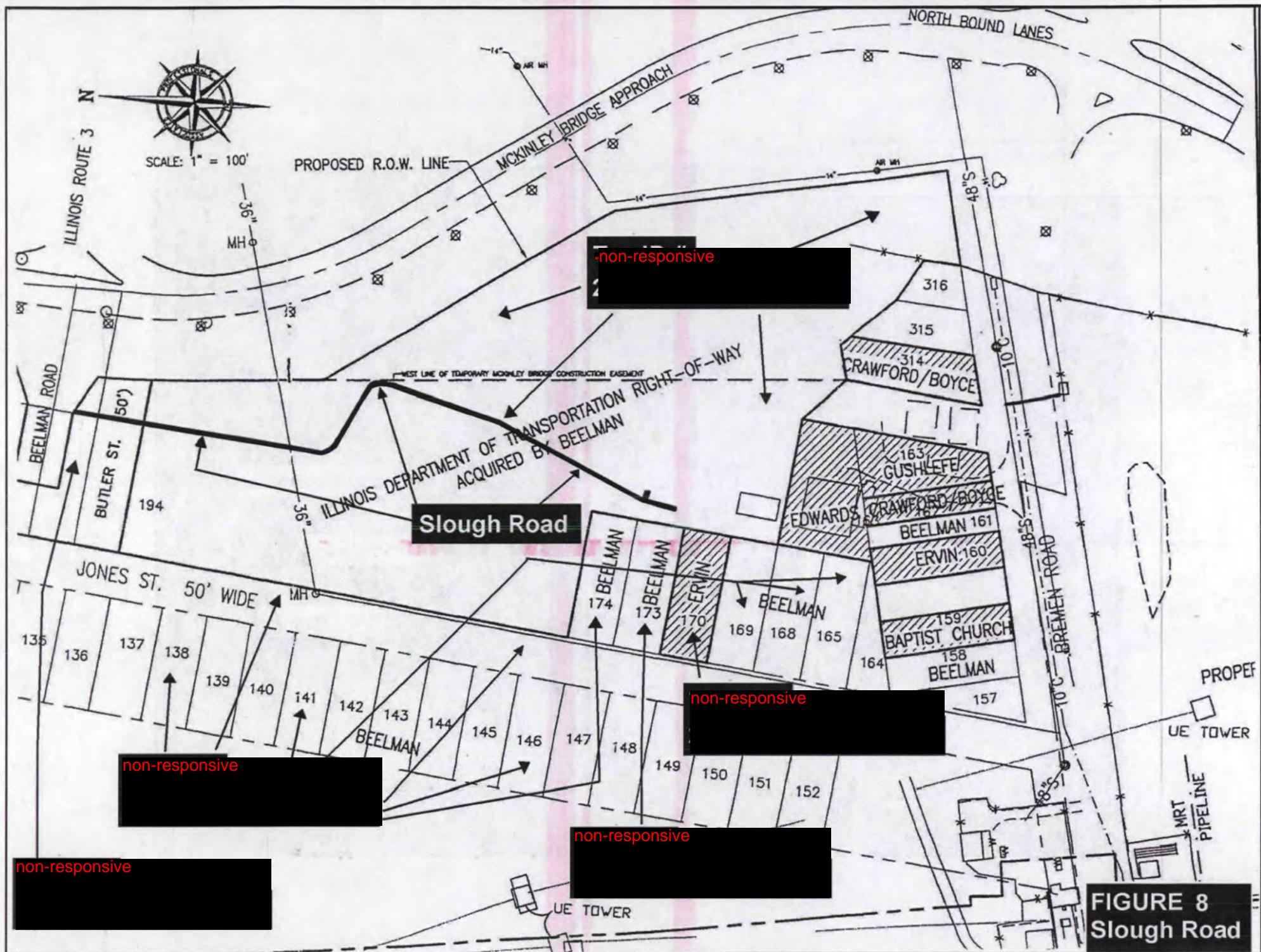
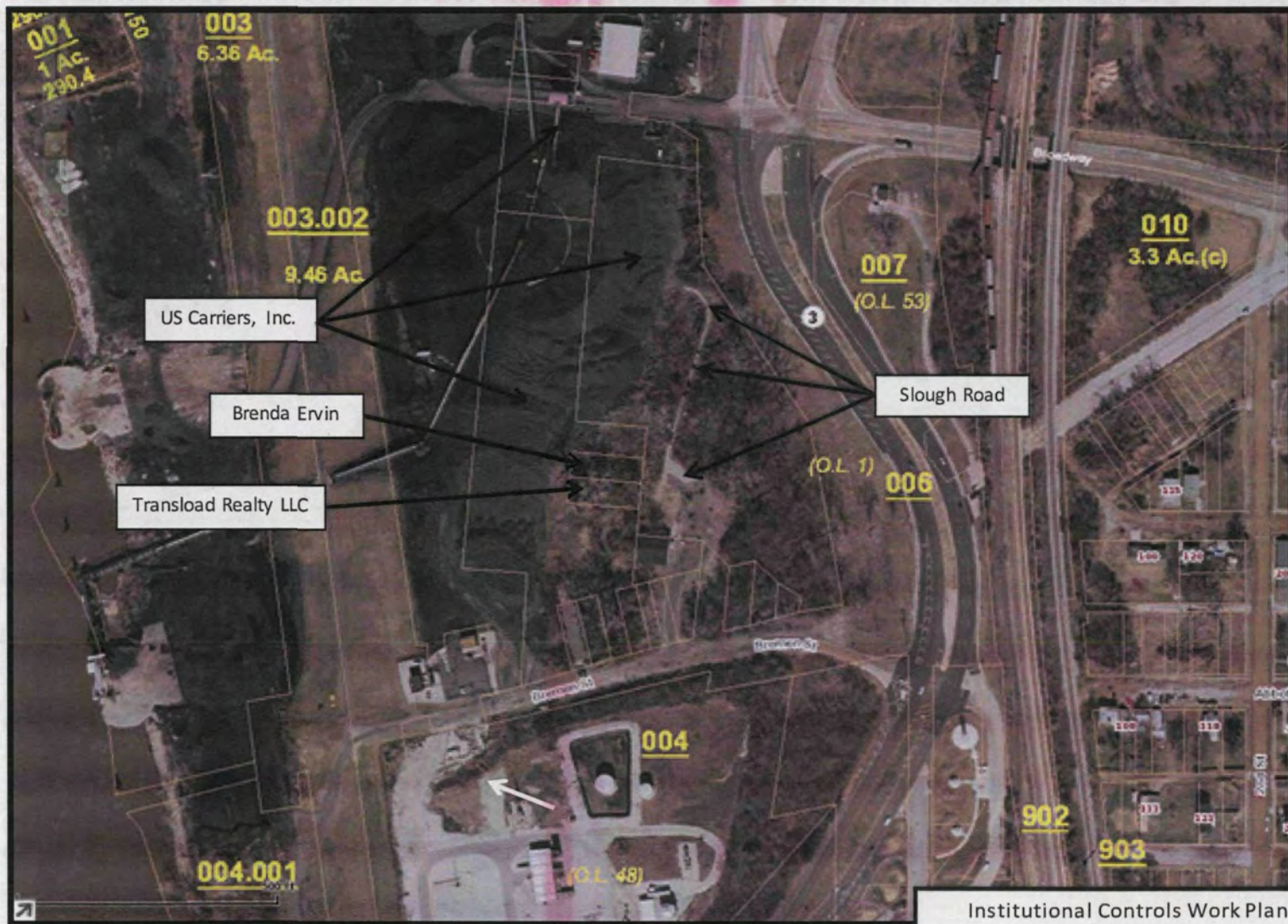


FIGURE 8
Slough Road



Institutional Controls Work Plan
Figure 9 – Slough Road

FIGURE 10 DENIED ACCESS PROPERTY LOCATIONS

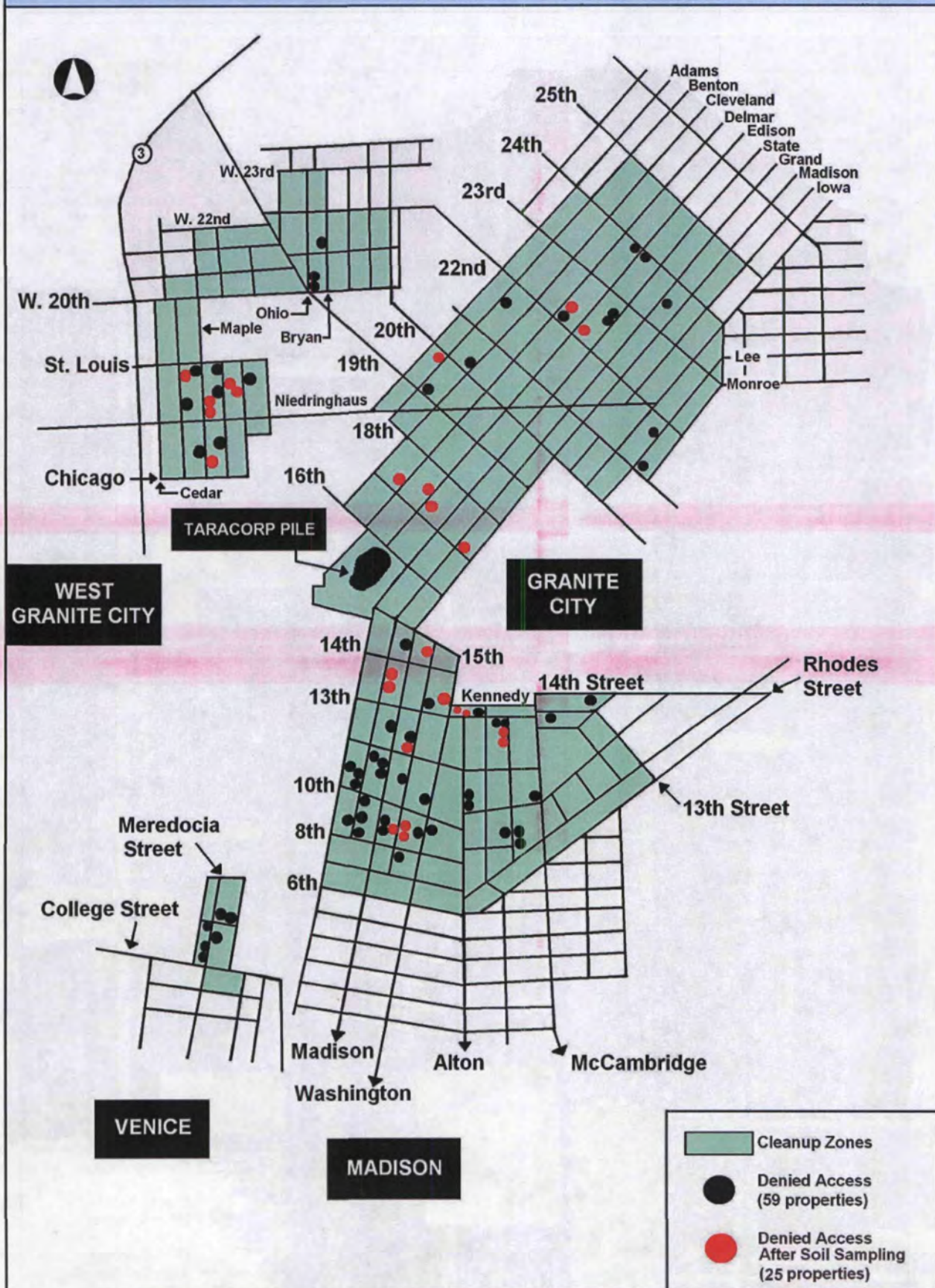
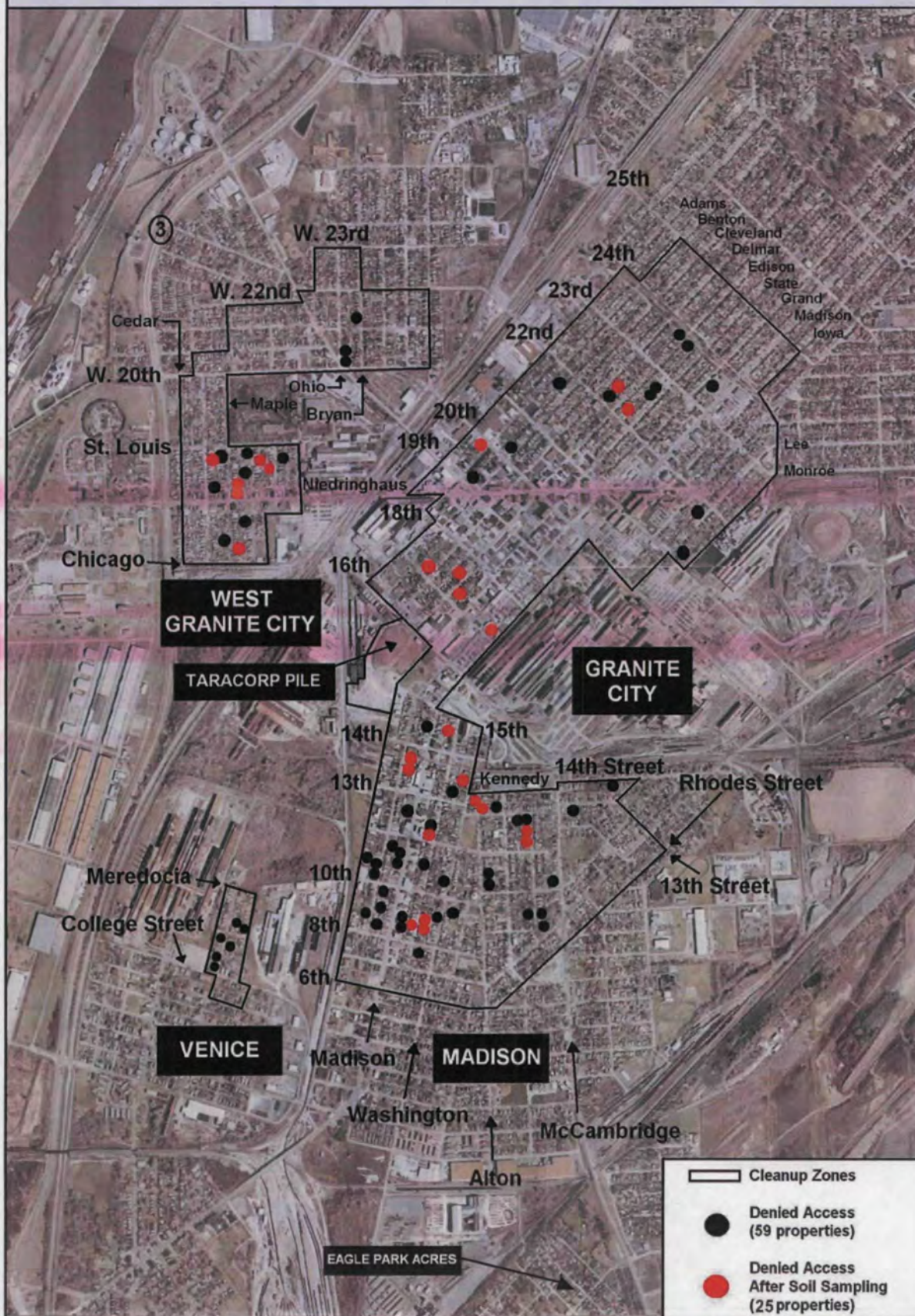


FIGURE 11

DENIED ACCESS PROPERTY LOCATIONS



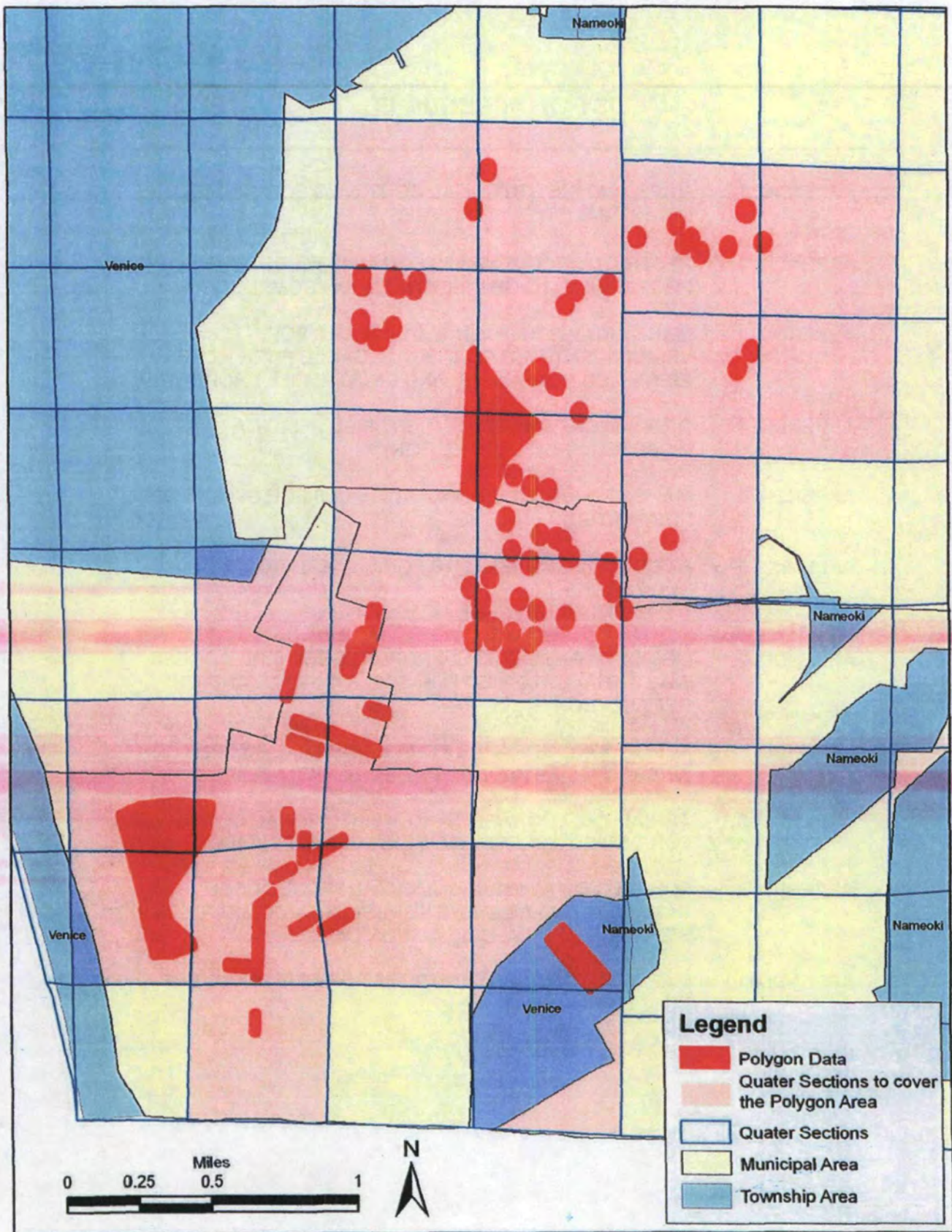


FIGURE 12
J.U.L.I.E. Map
One-Call
Notification Program

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